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THE

AMERICAN ECLECTIC

MATERIA MEDICA

AND

THERAPEUTICS.

BY

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OF CHILDREN, SPECIFIC MEDICATION, SPECIFIC DIAGNOSIS ON
THE REPRODUCTIVE ORGANS AND THE VENEREAL, ETC.

TWELFTH EDITION.

ἐκλέγω

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PREFACE

TO THE TENTH AND REVISED EDITION.

Whilst there have been great advances in the science of medicine, especially in therapeutics, since this work was first issued, the author deems it of importance to the profession that the old remedies and old methods should be kept in view. The practitioner needs to renew his acquaintance with them from time to time, that he may lose nothing good of the old practice, and that he may clearly trace the connection between the old and the new. The student requires it, that he may attain a complete knowledge of therapeutics and materia medica.

We claim to be a free and liberal class of physicians, and we do not recognize the right of any man either inside or outside of the Eclectic ranks to dictate what we shall use or how we shall use it. Every practitioner is personally responsible for the results of his practice. If he does a patient a wrong by large doses and poisonous effects, he is guilty to the extent of the wrong. If he fails to give relief or save life because of small doses and inefficient remedies, he is equally guilty. A physician is responsible to his patients in that he agrees to furnish that knowledge and skill which comes from thorough study and close observation. He can not claim that he has done his whole duty, unless he has been "eclectic" in fact, choosing from all sources that which to him seems best.

I do not think that any one can know what Eclecticism is unless he has studied it from the beginning. It is wonderful what a mass of material the "fathers" had gathered together, and it is a matter of equal interest to note the evolution of our present practice—specific medication—from this. The reader may think it strange, but three-fourths of modern homœopathy is from this source, and nine-tenths of modern Eclecticism.

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The old-time Eclectic used a weak infusion for its direct effect, where we now use five or ten drops of a powerful tincture in water for the same purpose. There was not even the difference in dose that many persons have supposed. True, our old doctor made a liberal use of emetics, cathartics, diaphoretics, and diuretics, but he knew when to use them. He vomited his patient when the stomach contained material it could not dispose of, and which was not only a cause of disease, but prevented the action of needed remedies. He did not put an emetic in an irritable stomach, or use it when it was not needed. He was rather free in the use of cathartics, but they were simple and mild, and he managed to "put them in the right place," and stopped when unpleasant materials had been removed from the bowels.

Though rough in his external appearance, he was "wise in his generation," and left it for modern scientists to go over the *pons asinorum* with quinine, morphine, and whisky, for all diseases to which flesh is heir.

Whilst we wish to do full credit to the "fathers" in our school, and present their views fairly, we will endeavor to show that our present teaching of "small doses of pleasant medicine for direct effect," is the rational outcome of the old studies. It will be presented in brief form, yet sufficiently full for all practical purposes. With the old and the new before him, the student should be able to make *his* study of therapeutics thorough, and *his* materia medica the assurance of a successful practice.

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A PRACTICAL TREATISE
ON
GENERAL AND SPECIAL THERAPEUTICS.

PART I.

GENERAL THERAPEUTICS.

THE term *Materia Medica* embraces all of those agents termed *remedial* or *curative*, which are employed either with a view to palliate or cure diseases. It treats of their natural characters, sensible qualities, chemical properties, and of their mode of action.

Remedies may be divided into two great classes. The first may be termed *psychical* or *mental* remedies, and embraces all those influences which may be brought to bear upon the mind of a person laboring under disease, and which often, if rightly applied, tend much to facilitate a cure. The second may be termed corporeal remedies, and embraces all agents of a curative nature, whether *imponderable* or *ponderable.*

Therapeutics is that branch of medical science which treats of the administration of remedies, and their effects upon the system. Thus, it treats of the changes in function, sensation, or action, wrought upon the system when in a state of disease, by the exhibition of the various agents included under the term materia medica, by which disordered function, sensation or action is subdued. In other words, it treats of the precise steps or series of influences by which morbid phenomena or diseased action is arrested, and health re-established.

In a more extended signification, therapeutics embraces not only the administration and mode of action of remedies, but it likewise takes cognizance of the morbid process existing—the pathology of the disease, the variance from a physiological condition or state of health. Thus says Dr. Dunglison: "To be a good therapeutist, a man must be well versed in every department of medicine, and be capable of observing and reasoning well. He may be a good *observer*, and yet a bad *reasoner*. He can not practice well unless he is both."

METHODS OF CURE.

It is maintained by homeopathists that there are but three possible relations subsisting between the symptoms of disease and the specific effects of remedies. The first is *opposition*, the second *resemblance*, and the third *heterogenity*; consequently there are but three methods of removing disease by the use of medicine, namely: *Antipathic*, *Homeopathic* and *Allopathic*.

ANTIPATHIA.

The *antipathic* method of curing disease consists in the use of appliances or medicines that produce effects of a nature opposed to the symptoms of the disease, and hence the axiom "*Contraria contrariis opponenda*." Hippocrates entertained these views, and may be regarded as the founder of this doctrine; for says he, "All diseases which proceed from repletion are cured by evacuation; and those which proceed from evacuation are cured by repletion. And so in the rest, contraries are the remedies of contraries."

Much of the practice in vogue at this time is based upon this principle. Purgatives are exhibited to relieve constipation; cold is employed to alleviate the effects of burns or scalds; narcotics to abate pain, etc.

Homeopathic physicians object to antipathic remedies; they assert that, although the primary effects of the agents named may produce phenomena opposed to the disease, yet their secondary effects are similar to those which they are exhibited to remove. They maintain that the primary effect of opium is *constipation*, but its secondary effect *diarrhea*; the primary action of purgatives is followed by *constipation* These secondary effects do sometimes follow the administration of remedies, though this can not be considered the rule.

but the exception. Thus diarrhea is of very uncommon occurrence as a result of the administration of opium; and though constipation may, and often does follow the use of purgatives, yet it is by no means an invariable result.

HOMEOPATHIA.

The *homeopathic* method of practice is that founded by Dr. Hahnemann upon the maxim "*Similia similibus curantur*," or in exhibiting remedies capable of producing effects similar to the disease for the removal of which it is given.

A few of the many examples claimed by the homeopathists as evidences of remedial agents producing effects similar to those of the disease for which they were administered, and by their so-called secondary effects proving curative, may serve to illustrate the doctrine which they maintain to be the only true one.

They assert that white hellebore has cured patients attacked with violent cholera, and yet it caused a disease similar to cholera, when exhibited. In a disease attended with great sweating, which occurred in England, called the "sweating sickness," it was treated successfully only by the use of sudorifics. Purgatives will cure the dysentery; tobacco occasions nausea and giddiness, and relieves the same; senna occasions colic, and is one of the remedies for this disease; ipecacuanha cures dysentery and asthma, because it produces hemorrhage and asthma; belladonna causes a sense of choking and horror of liquids, with fixed and sparkling eyes, and propensity to bite attendants—in short, a disease having the semblance of hydrophobia, which it is said this agent has cured. Opium relieves lethargy and stupor by converting it into natural sleep, and the same agent is a cure for constipation. The vaccine disease protects from smallpox upon the same principle. Cold, either in the form of snow, cold water, or some freezing mixture, is found to be the best application to frost-bitten parts. In scalds or burns, relief is obtained by exposing the part to *heat*, or by the application of heated spirits of wine, or oil of turpentine. We can not better illustrate Hahnemann's views of the action of remedies, than by giving the language of Pereira. "The medicine sets up in the suffering part of the organism an artificial but somewhat stronger disease, which, on account of its great similarity and preponderating influence, takes the place of the former, and the organism from that time forth is affected only by the artificial complaint. This, from the minute dose of the medicine used, soon subsides and leaves the patient altogether free from disease; that is to say, permanently cured."

Hahnemann conceives that the secondary effects of medicines are always injurious, therefore he recommends that no more be given than is absolutely necessary to cure the disease. Proceeding upon this principle, he has reduced the doses of medicines to such a minute state of division, that in many cases no human intellect is capable of appreciating the slightest influence from their administration. Many of them, when exhibited in full or ordinary doses, produce effects scarcely appreciable, and when reduced to the millionth, quintillionth, or even decillionth part of a grain or drop (the usual dose being large, say one or two drachms of the powdered article, or sixty drops of the tincture), how they then can exert any controlling influence over a disease that is grave, if they do so, as is asserted, is a mystery incapable of being solved by finite minds. To give credence to such a doctrine requires a stretch of imagination that we imagine few possess.

The method of obtaining these minute doses consists in reducing the solid to a powder, and mixing one grain of it with ninety-nine grains of sugar of milk—this is called the first *attenuation;* the second attenuation is obtained by mixing one grain of the first attenuation with ninety-nine grains of sugar of milk; and the third by mixing one grain of the second with the same quantity of sugar of milk, as before. In this way Hahnemann proceeds to the *thirtieth attenuation.* Alcohol is the diluent of liquid medicines, and the attenuations are obtained in the same manner—that is, by mixing one drop of the mother tincture or liquid with ninety-nine drops of water, and in this manner continuing the dilutions up to thirty, as in the case of solid substances.

The annexed table shows the strength of the different attenuations:

First attenuation,—one hundredth part of a grain.

Second attenuation,—one thousandth part of a grain.
Third " " millionth " "
Sixth " " billionth " "
Ninth " " trillionth " "
Twelfth " " quadrillionth " "
Fifteenth " " quintillionth " "
Eighteenth " " sextillionth " "
Twenty-first " " septillionth " "
Twenty-fourth " " octillionth " "
Twenty-seventh " " nonillionth " "
Thirtieth " " decillionth " "

The minuteness of the dose is carried to the same extreme, as seen by the following table, as presented by Pereira:

Charcoal, one or two decillionths of a grain.
Chamomile, two quadrillionths " "
Nutmeg, two millionths " "
Tartar emetic, two billionths " "
Opium, two decillionths " "
Arsenious acid, one or two decillionths of a gr.
Ipecacuanha, two or three millionths of a gr.

In modern homœopathy the decimal is used in the place of the centessimal. Thus a first trituration would be one of the remedy to nine of sugar of milk; the second one of the first to nine more of the sugar; the third one of the second to nine of the sugar, and so on. Dilutions are made in the same proportions without reference to *shakes*, and thirty one-ounce bottles, with thirty ounces of alcohol, would be sufficient to carry one drop of a remedy to the thirtieth dilution; and a thousand bottles and a thousand ounces of alcohol would carry it to the one-thousandth, which they mark M. Increasing the potency of a medicine by trituration or shaking, is now generally abandoned.

Such are the doctrines, and such an outline of this far-famed system of infinitesimal practice.

The principal facts urged against the doctrine, may be embraced under four heads:

1st. Many of our most certain and valuable medicines do not act homeopathically; sulphur does not produce scabies, nor does cinchona, or any of its preparations, give rise to intermittent fever; and yet these agents are used with great certainty for the removal of the diseases named, and no one questions their utility. Andral took quinia without contracting intermittent,—and who has seen that disease, or one similar to it, follow the use of cinchona? We have often employed it, without ever witnessing such results. It may be urged, however, that the diseased state which previously existed, precluded the development of that disease. Nor have we ever seen scabies follow the use of sulphur; but, perhaps, the homeopathist might say the existence of a previous morbid state acted as a barrier to its occurrence. Acids and vegetable diet cure the scurvy, but they never produce a disease analogous to it.

2d. Pereira asserts that many homeopathic remedies would increase the original disease, as acrids in gastritis, cantharides in nephritis or cystitis, or mercury in spontaneous salivation.

3d. The doses in which these agents are exhibited, are so exceedingly small, that it is difficult to believe they produce any effect on the system, and therefore we would suppose that the reputed homeopathic cures are clearly referable to a natural and spontaneous effort of the system, aided, perhaps, by strict attention to diet and regimen.

4th. Homeopathia has been put to the test in numerous cases, without the least perceptible improvement or change in the nature of the disease, and this under the immediate inspection of some of the most eminent members of that system of practice. "Andral tried it in 130 or 140 patients, in the presence of the homeopathists themselves, adopting every requisite care and precaution, yet in no one instance was he successful." Recently it has been put to the test, in some of the European hospitals, in a large number of cases; a given number of cases being treated homeopathically, and the same number of cases (all being similar) being left to the unaided efforts of the system,—regimen and dietetic rules alone being enjoined,—and the results were not very dissimilar in the two classes of cases.

If these be facts, the *attenuated* system of practice adopted by Dr. Hahnemann, can not be one upon which the practitioner of medicine can place reliance with any degree of confidence in diseases of a formidable character.

Whether we regard the homeopathic system of practice as wholly negative in its effects, or as positively curative, it matters not, so far as its merit is concerned. That it possesses merit, we do not feel at liberty to deny; but whether of a positive or negative character, is a question about which there is much dispute. So far as the rules of dietetics, as enjoined by homeopathists upon their patients are concerned, we have never seen any that surpassed, if, indeed, equaled, those which they have adopted. And so far, all will admit that their system of medication is positively useful and curative; and may we not inquire, is not much of the success which they claim for their practice, to be fairly and justly ascribed to this cause? Does not that rigid regimen, that scrupulous avoidance of every article of diet of an oppressive or indigestible character, leave nature free to act, and does it not invite her to assert her own prerogative?—does it not leave the *vis vitæ*, the *vis medicatrix naturæ* unoppressed, unobstructed, and independent, by which her powers rally, and she throws off disease, and abnormal action is arrested? May we not reasonably account for many cures in this way? We think it is not unreasonable to award much credit to this system of practice, upon the grounds above named. Then if it be not regarded as positively curative in this respect, so far as a system of medication is concerned, yet it is important for the reason that it leaves nature free to act and rid herself of disease, and is, therefore, to be regarded as a highly valuable mode of *negative medication*. Do we not daily see febrile and inflammatory diseases relieved in this way without a particle of medicine; every one of common observation knows this to be an indisputable fact. How often do we see many of the most obstinate diseases relieved by the unaided efforts of the system. We have often seen patients recover, who we believed to be dangerously ill, but who, from an aversion to drugs, a fear of poisonous agents, penuriousness, or some other cause, did nothing of an active character. Then may we not truly say, nature is all-powerful in throwing off disease. If, then, nature effectually eradicates a vast number of diseases, and those that baffle the skill of the most experienced physicians, even when called at an early hour in their course, and aided by the best of care, may we not reasonably conclude that recoveries would be very numerous if no physician of any kind was called, and no medicine administered.

May we not reasonably and justly conclude, from what has been just stated, that the *attenuated* form of medication — the *infinitesimal doses*, often receive credit when none should be awarded to it; that their influence is imaginary and not real; that they exercise no positive curative agency in many, perhaps not in any case in which they are administered, but in which it is ascribed to them; that their effects are *negative*, and that the powerful influences, benefits and advantages, claimed to follow from the exhibition of the millionth or decillionth part of a grain of *charcoal*, *common salt*, or of *silex*, or *sand* (and all other agents when administered in a form so attenuated), and carried out according to the doctrines of Hahnemann, are but an imposition on the credulity of the people, which must be apparent to any one who investigates the subject. Does it not seem to be practicing upon the *expectant* plan wholly? Does it not seem to be a mere *placebo*—the *bread-pills*, or *colored-water* exhibited in a new form. To believe that a dose of the most simple agent so minute that it is entirely beyond the conception of the human mind, exercises such a powerful control over the human system when in a state of disease, requires an imagination so acute (it seems to us) as it falls to the lot of but few mortals to possess. As well may we imagine that the millionth or decillionth part of a grain of our daily sustenance, taken three times a day, will be sufficient to sustain life; that it will support the wants of the animal economy, and maintain all the varied processes of secretion, excretion and innervation, as that a similar amount of salt, charcoal, etc., will effect great sanative changes upon the human body when in a state of disease.

Although we can not repose confidence in the Hahnemannian system of medication as a whole,—as a *positively curative* system,—but must regard it as a *negative* one, yet we are fully satisfied it will be of great good to the medical profession, and to mankind generally. We have long since been fully persuaded that too much medicine was used—that the patient was too frequently and too largely dosed with drastic, corrosive, or poisonous drugs, without any definite object or well-defined reason in view on the part of the physician. Less medicine will be found to be to the advantage of patients, and physicians will learn from the homeopathic system to administer it in smaller quantities, to give it less frequently and with a definite object in view, and above all, to *repose more confidence in the recuperative powers of the system*, when untrammeled by the use of nauseous, and often oppressive and disease-creating drugs. In this light we view homeopathy as positively advantageous, and as calculated to bring about, or aid in bringing about an important reform in the practice of the healing art.

We regard the principle of "*Similia Similibus Curantur*," as laid down by Hahnemann in the administration of medicine, as true in some cases, but not as being an infallible or invariable rule, by which the physician is to be governed in all cases. Disease was treated upon this principle long before the day of Hahnemann; but when disease is treated in accordance with this axiom, the remedy, in order to prove effectual, is best given in sensible doses.

ALLOPATHIA.

The allopathic or heteropathic method of cure is based upon the exhibition of remedies which produce phenomena neither similar to, nor exactly opposite to those of the disease. It consists in curing disease upon the axiom "*Contraria Contrariis Curantur.*"

By this mode, a cure is effected by *counter-irritation* or *antagonism;* in other words, by establishing an artificial or secondary disease that shall displace the primary one. This practice is based upon the influence which one disease is known to exert over another; as, for instance, the supervention of diarrhea during the progress of some other disease, with a subsidence of the original disease, apparently the result of the diarrhea. Occurrences of this kind undoubtedly first prompted the use of agents producing alvine evacuations in similar cases. Cutaneous eruptions sometimes appear and are soon followed by the disappearance of an internal disease existing at the same time; and the disappearance of the eruption is often followed by some internal disorder. These occurrences then point to the use of blisters and other revulsives, with the view of establishing an artificial disease.

One disease seems to modify another, then, by establishing a new point of excitation—an artificial disease; thus by securing an increased nervous and vascular afflux to that part, the original disease is modified or subdued. The maintenance or duration of the primary disorder depends upon the concentration of nervous and vascular afflux to the part secondarily affected; now it is evident that if a new point of excitation is established, in proportion to the concentration there, or to its localizing influence, must be its power to derive from and weaken the force of the original disease.

Many of our medicinal agents prove curative, by exciting a stronger irritation than exists at the location of the primary disease, the effects of the remedies being produced in another part of the system, and in a different tissue. There are but few remedies but what act to a greater or less extent in this manner. Thus all the appliances brought to bear upon disease, make new impressions, modify the old ones, and change the sensation, action, or function of some organ, tissue or part, by which the original morbid condition is altered or subdued; in other words, they exert a relative influence over disease, or cure it by *conversion*, or by the production of a new pathological state that subsides as soon as the action of the agent ceases its operation.

In the present state of our knowledge of the action of remedies, and the laws governing the animal economy, we can give no satisfactory theory or hypothesis of the manner in which this cure by revulsion or counter-irritation is accomplished. Dr. Parry advances the theory that most diseases consist in, or are attended with local determination of blood, and that it is a law of the human constitution that excessive morbid determination to two different parts shall not exist in the same person at the same time. This will not explain, however, even admitting the proposition, why the secondary excitation and determination detracts the circulation from and relieves the parts primarily irritated. Again, we have attempts to account for it, by the supposition that the system only generates a certain quantity of nervous force in a given time; in disease, the part affected receives much more than its normal proportion, and by a secondary excitation this surplus is determined to the point last affected, and thus the original disease is much mitigated.

These are hypotheses which it would be unprofitable to pursue further, but we may notice with much advantage the laws which appear to govern the action of such remedies as come under this head, and which affect the secretions. These have been arranged by Müller as follows:

1. The increase of a secretion in a tissue, *a*, which is less irritable than the organ *b*, is incapable of producing a diminution in the secretion of the latter; hence, for example, artificially excited secretions from the skin, as by a blister, in the neighborhood of the eye, in inflammation of the latter organ, are of no service, because the eye is a more irritable part than the skin.

2. An increased secretion in a certain tissue, *a*, can not be diminished by exciting the same secretion in another part of the same tissue, *a;* on the contrary, such a procedure would rather increase the secretion from all parts of the tissue than diminish it, because the relation which exists between the different parts of one and the same tissue is that of sympathy, not of antagonism. Hence, a discharge from the generative or urinary organs can not be arrested by an artificially excited diarrhea.

3. On the contrary, the secretions of tissues which do not belong to the same class of structures often antagonize each other. Thus, increase of the cutaneous secretion frequently induces diminution of the secretion of the kidneys. In summer, the cutaneous exhalation is more abundant, and the urinary secretion proportionably scanty; in winter, the reverse is the case. Effusion of watery fluids into the cellular membrane and serous cavities is attended with dryness of the skin and diminution of the urinary secretion, the quantity of which is observed to increase in the same proportions as dropsical effusions diminish. Suppression of the exhalation of the skin by cold gives rise to mucous discharges from the intestinal and pulmonary mucous membranes.

4. It is only toward the termination of consumptive disease that this relation of antagonism between the secre-

tions ceases to exist; when, in consequence of the relaxed state of the tissues, all are at length increased in quantity. In the colliquative state that precedes death in phthisical patients, colliquative diarrhea, profuse sweating, and dropsical effusions take place simultaneously.

5. When one tissue is excited to increased action by an impression made upon another, either the secretion of the two must have been in some respects similar, as in the case of the skin and kidneys, both of which have the office of excreting water from the blood; or the organ thus excited must have had a predisposition to morbid action, which is the rational explanation for the circumstance that the impression of cold produces in one person an affection of the mucous membrane of the lungs; in another a disordered secretion of mucus in the intestinal canal.

BRUNONIAN THEORY.

Dr. John Brown maintained the doctrine that all living beings are endowed with a peculiar principle, which he terms *excitability*, and that serves to distinguish them from inanimate bodies. "The agents which support life are termed *exciting powers*, and these, acting upon the *excitability*, maintain life; in the language of Brown, they produce the effect called *excitement*." Those agents that modify the excitability, and produce a greater or less degree of excitement, are termed *stimulant powers;* these are either *universal* or *local.* When the exciting powers act moderately, *health* is produced; when they act with too great energy, they cause *indirect debility*.

He arranged all diseases under the two divisions of *sthenic* and *asthenic*, and maintained that all remedies acted as *stimuli;* so that we had only to increase or diminish their force according to circumstances, for they differed from each other in little more than the degree with which they exerted their stimulant power. He also maintains that they could not cause exhaustion of the excitability except by excessive action, or by producing previous over-excitement.

In answer to this theory, it may be said that many, perhaps all of the narcotic and sedative agents produce exhaustion, without occasioning any apparent excitement previous to this effect. Such is the case with digitalis, hydrocyanic acid, and many other agents that might be named. It is utterly impossible to ascribe death (when they occasion it) to any previous excitement which they produce. Agents which prove most destructive to life, seem to exert the least excitant influence over the animal economy. It can not be said that agents which exert no obvious excitant influence over the system, or those which produce no immediate or unmistakable impressions upon the organs of our bodies, are less curative, or produce less mistakable effects upon the system, than those that possess clearly excitant powers.

The great majority of our medicines, says Pereira, act neither as stimulants nor sedatives merely; they alter the quality of the vital actions, and this alterative effect has been quite overlooked by the Brunonians.

DOCTRINE OF CONTRA-STIMULUS.

This doctrine is but a modification of the Brunonian theory. It was first advocated by Rasori and Borda, and subsequently by Tomasini and other distinguished Italian physicians. According to this doctrine, there are but two classes of medicines—*stimulants* or *hypersthenics*, and *contra-stimulants* or *hyposthenics*. "The first exalt, the second depress the vital energies."

This hypothesis obviates one of the objections to the Brunonian theory, since it recognizes agents that do positively possess the property of reducing vital action. From these positions it will be seen that contra-stimulants, or depressing agents, are indicated in all cases of exalted organic action; and stimulants are demanded in all depressed states of the vital forces. Although the general principles of this doctrine are correct (providing we take a correct view of the pathology of disease), yet the deductions drawn from them are fallacious in many respects. Wine and other alcoholic liquors are stimulant, and to relieve the nebriation which they occasion, *contra-stimulants*, say the advocates of this theory, must be employed; yet who uses the digitalis, or hydrocyanic acid, to relieve that state of torpor which those liquids produce? Or do those who are in the habit of resorting to the use of tartar-emetic and the lancet, in high febrile or inflammatory action, employ them to relieve intoxication?

Many agents denominated contra-stimulants, act locally and primarily as stimulants, as in the case with the majority of cathartics. Some of the narcotics (as the opium) act primarily as stimulants, and secondarily as sedatives, providing the dose is sufficiently large. Many agents, and even whole classes of remedies, exert neither a primary stimulant, nor a secondary contra-stimulant influence over the organs of the body, to which we can ascribe their curative powers. This is especially the case with tonics, astringents and alteratives. The advocates of this doctrine are by no means agreed as to the action of certain agents, for some regard cinchona as stimulant, and others as contra-stimulant.

Cold is the most powerful contra-stimulant, if carried to excess, and yet how vigorous the reaction, how violent the inflammation that often follows its moderate application to the system. From this it will appear that the broad ground of *stimulant*, or *contra-stimulant*, as advocated by them, and as applied to therapeutic agents and influences, is based upon an erroneous foundation. Agents the most dissimilar and opposite in their effects are grouped together, while those possessing analogous properties are separated by the founders of this doctrine. "They judge of the nature of a disease," says Pereira, "by the effect of the curative means, and of the virtues of medicines by the nature of diseases. So that if a disease now supposed to be sthenic, should hereafter prove to be asthenic, the medicines used to relieve it would immediately pass from the class of contra-stimulants to that of stimulants."

As fallacious as are these doctrines, one truth has been derived from this source, and this is the *tolerance* of large quantities of some remedies by the system, when laboring under disease. In febrile and inflammatory action, when the grade of excitement is high, patients can bear much larger doses of some agents without causing evacuations, than under other opposite states of the system. Under the circumstances named, much larger doses of emetic or cathartic substances are required to produce their ordinary effects, than when the grade of excitement is less vehement.

From this it appears that the state of excitement increases the *tolerance* of the remedy.

CHRONO-THERMAL SYSTEM OF MEDICINE.

The system of medicine advocated by Dr. Samuel Dickson, styled the *Chrono-Thermal*, assumes the position that all disease is a *unit;* that *unity of morbid action is the type of disease;* that this morbid action in all diseases is *one* and *identical*, and that this is *intermittent fever;* in other words, all diseases assume periodicity.

In presenting an epitome of this system of medicine to our readers, we can not do better than to make such extracts from the writings of Dr. Dickson as will give a clear idea of his views. The doctrines advanced by him, though peculiar, convey much truth, and we can not but think that their perusal will gratify and prove instructive to our readers.

The following are the positions assumed by Dr. Dickson on the subject of health and disease:

1. The phenomena of perfect *health* consist in a regular series of alternate motions or events, each embracing a *special period* of time.

2. Disease, under all its modifications, is, in the first place, a simple *exaggeration* or *diminution* of the amount of the same motions or events, and being universally alternative with a *period* of comparative health, strictly resolves itself into *fever—remittent* or *intermittent*, *chronic* or *acute;* and all local affections, or structural lesions, occurring during its progress, are but incidental occurrences, not original maladies.

Dr. Dickson terms all remedies "*chrono-thermal*, from the relation which their influence bears to *time*, or *period*, and *temperature*."

Disease, according to this system, is much simplified, and is amenable to a principle of *treatment* equally simple. A disease partakes of the nature of *ague* throughout all its modifications; those agents best calculated to relieve that disease, according to this theory, will be found most effectual in removing the same disease when it presents itself under some of its diversified forms, although not recognized ordinarily as being allied to *ague*.

Hippocrates announced, says Dr. Dickson, more than twenty-three centuries ago, the unity of morbid action, and that the type of all disease is *one* and *identical.* These positions Dr. Dickson maintains with great enthusiasm, and proposes to prove "*the unity of all morbid action, and the unity and identity of the source of power of various agencies, by which disease of every kind may be caused or cured.*"

Disease is an error of action, says he; a greater or less variation in the motion, rest and revolutions of the different parts of the body, reducible, like the revolutions of *health*, into a systematic series of periodic alternations, in the course of which the matter of a structure occasionally, by its atomic changes, alters its natural character and chemical relations; so much so in some cases, as to become even completely decomposed and disorganized.

Again he remarks: "The human body, whether in health or disease, is an epitome of every great system in nature. Like the globe we inhabit, it has in health its diurnal and other variations—its sun and shade—its times and seasons—its alternations of heat and moisture. In disease we recognize the same—long chills and droughts—the same passionate storms and outpourings of the streams, by which the earth at times is agitated—the matter of the body assuming in the course of these various alterations, changes of character and composition, such as abscesses, tumors and eruptions, typical of new forms, as mountain masses, earthquakes and volcanoes. All these, too, like the tempests and hurricanes of nature, *intermitting*, with longer or shorter periods of tranquillity, till the wearied body either regains, like our common mother, its wonted harmony of motion, or like what we may conceive of a world destroyed, becomes resolved into its pristine elements."

"The actions of life in health are all, as you have seen, *periodic*, and however, or by whatever caused, their morbid modifications, termed disease, are periodic also."

Although he assumes that *ague* is the type of all diseases, yet he accounts for the differences met with in the different forms of disease, by saying that all *agues* are not equally perfect. The different stages may, and often do, vary in duration: the bolder features or symptoms may be all more or less subdued; the intermission, or immunity from suffering, instead of extending to a day, or days, may be only an hour or two in duration. This disease is now no longer *ague*. Physicians change its name to *remittent fever*. All the different grades of fevers—as *remittent, continued, typhus*—as well as the innumerable varieties of other diseases, are but shades or modifications of the same disease, although christened or baptized by a new name.

"Call the symptoms *ague, fever*, or what you please, *constitutional disturbance* is the prelude to every disease, the precursor of every kind of local mischief; though in numerous cases, if not in all—more especially after repeated paroxysmal recurrence—*superadded phenomena* appear, and these last may be either *functional* or *organic*—and in some instances they are of a kind so grave and important as to throw the constitutional symptoms for a time altogether into the shade. Some part of the system, in a word, may be so much more prominently implicated than another, as to become the chief feature of the case—*functionally*, if the *motions* be only *anatomically* altered—*organically*, if the part in question be threatened with a change in its structure tending in any way to its destruction or decay."

"The causes of all disease can only affect the body through one or more of the various modifications of *nervous perception*. No disease can arise independent of this; no disease can be cured without it."

Among the agents which he styles *chrono thermal*, and occupying a prominent rank, is the cinchona. This agent he regards as valuable in gout, rheumatism, scrofula, scurvy, diseases of the bones, gangrene, etc., as well as in a multitude of other diseases assuming periodicity, and he refers tc corroborating testimony to sustain his position. Prussic acid is next in importance to the bark—this he esteems exceedingly valuable. Opium and the salts of morphia occupy the third rank in the list of chrono-thermal agents, and next to them alcohol, wine, and malt liquors are noticed. These act beneficially, or the reverse, says he, in no other manner than by changing the temperature of the brain.

Musk, valerian, camphor, silver, zinc, arsenic, asafœtida, nux-vomica, strychnia, iron, copper, with a large number of agents from the vegetable kingdom not noticed in this place, with various other appliances, are all denominated chrono-thermal remedies. They are employed with a view to destroy the periodic character of all diseases, and with a view of expelling them from the system.

Such is an outline of the *chrono-thermal* system of practice; and although some of its features do not accord with the doctrines now styled orthodox, yet there is some truth in them. Upon taking a general survey of the innumerable diseases to which our bodies are subject, every one must see at once the tendency there is to exacerbations and remissions, thus constituting the periodicity which Dr. Dickson maintains all diseases assume. The periodic character of many being irregular as to time, intensity, duration, etc., does not seem to militate against the doctrine in question. The fact that exacerbations and remissions do occur, although irregular, goes far to prove the truth of one proposition of our author. As to the agents used, it may be questioned whether all those named, and those in general use act as antiperiodics. It may be said, however, that they lessen exalted organic action, and subdue or break down the exacerbation, and thus exhibit their claim to be ranked with *antiperiodics.*

HYDROPATHY.

Although the "*water-cure treatment*" had been employed to a limited extent as an auxiliary remedial measure long anterior to the days of Priessnitz, yet to him belongs the credit of introducing it into general use as an independent curative system.

As an independent course of treatment (all drugs being rejected), we think it erroneous; but as an auxiliary to other means of cure, there is no doubt but that it is one of the most efficient that can be adopted.

The efficacy of hydropathy is fully recognized by Dr. Pereira, who remarks: "The cold-water cure, or hydropathy, though not yet admitted, by the medical profession, among the legitimate means which may be beneficially employed in the treatment of diseases, undoubtedly includes powerful therapeutic agents." He further says: "It does not confine itself to the use of cold water only, but includes dry sweating, diet, exercise, and regulated clothing."

Prof. Carpenter remarks that the hot-air bath, in some cases, and wet sheet, as used by hydropathists, act powerfully as diaphoretics, and will probably be more extensively employed, as the importance of acting on the skin, as an extensive collection of glands, is better understood.

Prof. Williams says: "The reaction which follows the judicious use of cold, as a therapeutic agent, may prove serviceable not only in resisting the further influence of cold, but also to remove congestions and irregularities in the circulation from other causes, and to excite in the capillaries and secernents, new actions which may supersede those of disease."

Dr. Edward Johnson, in his work on hydropathy, says: "In examining the subject of hydropathy, we are first to consider it as one great whole, consisting of many parts, as the wet-sheet packing, the blanket packing, the dry sweating, the vapor sweating, cold baths of various kinds and different degrees of power; clothing, systematic exercise, and regulated diet. In inquiring into its mode of action, therefore, we must first look to its general effects as *one whole*. These, I presume, will not be disputed by any one. They are to strengthen the digestive functions; to cool the system; to increase the appetite; to allay excitement; to purify the blood; to strengthen the muscular fiber of the heart; to quicken the action of the skin (which is to the hydropathic treatment what the stomach and bowels are in the drug treatment; to overcome internal congestions; to restore and augment all the secretions and excretions; to accelerate the *change of matter*, and thus renovate the tissues of all the organs, and to invigorate the vital principle."

Again, Mrs. Nichols remarks: "It prescribes a pure and healthy diet, carefully adapted to the assimilating powers of the patient; it demands pure air and strengthening exercise, with other moral hygienic conditions. The applications of water, according as they are made, are cleansing, exciting, tonic, or sedative. Water clears the stomach better than any other emetic, produces powerful and regular evacuations of the bowels, excites the skin—the great deterging organ of the system—to throw off masses of impurities, stimulates the whole absorbent and secretory systems, relieves pain more effectually than opium, dissolves acrid and poisonous matters, purifies the blood, reduces inflammation, calms irritation, and answers fully all the indications of cure; to fulfill which, physicians search their pharmacopeias in vain. The proper application of the process of the *water-cure* never fails of doing good. Its only abuses come from ignorance. The water-cure physician requires a full knowledge of the system, and a careful discrimination in applying it to various constitutions, and the varied conditions of disease." Hydropathists are opposed to all medicines, at least many of them. "Unassisted nature, where there is a large stock of vitality, may triumph over both disease and medicine. The success of the homeopathic practice shows, that the less medicine taken, the oftener nature asserts her rights. But the *water-cure* equalizes the circulation, cleanses the system, invigorates the great organs of life, and by exciting the functions of nutrition and excretion, builds up the body anew, and re-creates it in purity and health."

For medicinal purposes, soft, fresh, pure spring water is always to be preferred. Lime-stone water, or water containing saline matter in solution is not so good, and even soft water—as rain-water, if it has been standing in tanks or cisterns—is less beneficial.

The modes in which water is employed as a remedial agent are numerous; we may notice, with advantage, the *plunge-bath*, the *pouring-bath*, the *dripping-sheet*, the *douche*, the *sitz-bath*, the *wet-sheet pack*, and the *blanket-pack*.

The *plunge-bath* consists in immersing the entire person in the ordinary bathing apparatus. In all cases the head should be wet before applying the water to the surface.

The *pouring-bath* consists in applying a suitable quantity of water to the surface, by expressing the water from a sponge, or by pouring it from a suitable vessel upon the body.

In using the *dripping-sheet*, the entire body is to be enveloped in a sheet dipped in cold water while the patient is standing; at the same time rubbing him briskly outside of and with the sheet. This bath is much prized in febrile diseases, but it is obviously inappropriate when the patient is much reduced, or in the advanced stages of disease.

The *douche* is applied by dashing cold water upon the surface of the body, or by directing a stream or jet of water from a force-pump, or by an affusion of water from a hight varying from five to twenty feet, letting it fall on different parts of the body; the full force of the douche not being allowed to fall upon the head. This is powerfully excitant, and often proves eminently serviceable in certain forms of chronic disease, as in spinal and nervous affections, in tumors and rheumatic swellings, as well as in many other cases.

The *sitz-bath* is a highly efficacious mode of applying water in some diseases. It consists in seating the patient in water at first tepid, but by degrees diminishing the temperature to its natural standard. The water should completely cover the pelvic region, which may be done in the absence of the proper *sitz-bathing apparatus*, by substituting the ordinary wash-tub, with a suitable amount of water. It is employed as an excitant and tonic to the pelvic viscera and bowels, and as a derivative in diseases of the brain and superior parts of the body.

The *shallow* or *half-bath* is similar to the other; the patient is seated in shallow water (say three or four inches deep), and rubbing the body, or being rubbed by an attendant. It is esteemed beneficial in febrile and congestive states of the system.

The *wet-sheet pack* is said to be the most powerful and universally applicable mode of applying water in the cure of disease, and consequently has been denominated the *sheet anchor* of hydropathic practice. It is extensively employed in nearly every variety or stage of disease. It is especially useful in febrile diseases, to diminish the excessive heat of the surface, lessen exalted action, equalize the circulation, promote perspiration, relieve pain, subdue spasms, remove obstructions, and secure tranquillity, which usually is succeeded by a profound and refreshing sleep. It consists in spreading one or more comfortables and two or more blankets upon a bed or mattress, over which a sheet that has just been dipped in cold water and wrung until no more will run from it, has been spread. Upon this the patient is to be placed, being divested of his clothing, and the wet sheet wrapped closely around the body, so as to bring it in contact with every part of the surface, the face excepted. Then the blankets are to be tightly wrapped around him, and over these comfortables, blankets, or a light feather-bed may be thrown. If very weak or chilly, heated bricks or bottles of hot water may be applied to the armpits and to the feet If the reactive powers of the system are sufficiently strong artificial heat is to be avoided. If the head ache, a towel dipped in cold water is to be applied. In this condition the patient should remain until reaction is complete, and warmth fully established. In most cases the patient sweats freely. If uneasy and nervous, the covering may be removed at any time, when immersion or affusion of cold or tepid water should be immediately resorted to. This rule is not to be violated, except in high grades of inflammatory action, when one wet sheet after another is to be applied in quick succession.

The *blanket-pack* consists in the application of dry blankets, instead of the wet sheet, until perspiration is excited, when some one of the cold baths is to follow, succeeded by brisk frictions with the coarse towel, flesh brush, or dry hand, in order to excite the skin and produce a healthy and vigorous reaction. If the strength will admit, he should rub himself vigorously in all cases.

The reader must not understand that the baths are always to be cold, as in the earlier days of the water-cure. We employ them at all temperatures from 30° to 180°. The temperature of the bath is adapted to the condition of disease, and it is a little singular that nearly the same effect follows from brisk sponging with water at 32° and as hot as can be borne.

Ablutions, affusions, etc., when applied to the surface in febrile and inflammatory states of the system, serve to depress the exalted action, act as sedatives to the circulation, diminish the temperature of the body, promote perspiration, and break up that morbid association of action upon which the continuance of disease seems often entirely to depend.

It is also a very powerful means of revolutionizing the system in chronic affections. The shock, the new and powerful impression which it imparts to tens of thousands of nervous fibrilla and capillary vessels, spread out on that extensive, highly sensitive and strongly sympathizing tissue, the skin, is indeed great, and we must at once recognize the utility and immense importance of these applications to the surface. The shock which it imparts to the whole nervous system is calculated to secure a vigorous reaction, if properly applied; to arouse all the secretory and excretory organs of the body, impart new vigor and energy to languid and atonic organs, augment muscular and nervous activity and power, and yet calm irritated action, and secure tranquillity when the nervous and muscular equilibrium is interrupted. In these ways it increases the vital forces, and stimulates the recuperative powers of the system; hence it may be said to be one of the most important alteratives and tonics of the materia medica.

We have thus given a synopsis of the most prominent theories advanced upon the subject of practical therapeutics. In each of these we find some truths, but in all much error. The main difficulty with all of them appears to be that their originators did not pay sufficient attention to the facts of pathology, or if they did this, that their reasoning was based upon the action of remedies that we would not consider curative under any circumstances.

To properly understand this subject, it is necessary that we fully understand the pathology of disease, the reasons why the system, or a special organ, deviates from its normal healthy action, the causes that produce this, and the changes in structure that are occasioned by it. Knowing this, we should then carefully observe the means by which nature removes diseases, recollecting that the all-wise architect who formed our bodies to meet every requirement of our existence, was not forgetful that they would be subject to disease. *Can man be more wise than his Maker?* If he can not, why then should he try to add something to that which was before perfect; why should he try to create new eliminating organs, to make a laboratory of a man's sanguineous system, trying by means of poisonous chemical agents to counteract a *materies morbi* of which he knows nothing? In the next place, the therapeutist should carefully choose such means as will assist nature in relieving herself of disease, by acting in the same manner and exciting the same parts and organs, as do relieve the system of the morbific matter, when the natural powers of the system are the physician.

We would strongly impress it upon the mind of the reader, and especially upon the student, that no man ever yet cured a disease, nor ever will. All that any can do is to assist nature in effecting a cure. How often do we hear physicians talk of healing wounds, as if the entire process depended upon their skill, when, with their utmost efforts, they could not produce a single cell, fiber, or even a fluid similar to the coagulable lymph which is the basis of repair.

What then is the province of the physician? The following propositions, laid down by the eminent German physician, Hufeland, express our views of it:

1. Art sometimes can take away the whole disease by removing the exciting cause, and so dispense with the internal curative process of nature, e. g., by removing a foreign body, a poison, a gastric accumulation which produces the disease, etc.

2. The vital power is sometimes too exalted, and its operations too impetuous and violent;—so much so, that it may consume itself or injure noble organs. Here art can effect that degree of reduction and depression which is requisite to bring on a perfect crisis, and to prevent dangerous occurrences.

3. On the other hand nature may not have sufficient power, to perform the internal curative process. Here art interferes, raises and makes up, by suitable and strengthening remedies, the deficiency; and thereby only renders the internal cure possible.

4. Art can remove obstacles, which render the curative process of nature difficult or impossible. Under this head falls the important point of a proper diet, quietness in febrile diseases, guarding from the influence of impure air, injurious aliments and the like.

5. Art can support nature in combating particular forms of disease, by appropriate remedies conformable to the malady.

6. Art can assist nature in the commencing crisis and bring it to perfection.

7. Finally, there are morbific matters and conditions of which unassisted nature can not get rid, e. g., the syphilitic virus, mechanical lesions, etc. In such cases the assistance of art is indispensable, either for improving the quality of that matter by means of agents counteracting its virulence, or for lending mechanical or surgical assistance.

Such is the province of the art of healing, and such are its limits. The physician must not pretend to be *magister*, but *minister naturæ*, her servant or rather assistant, her ally, and friend. He is to go with nature hand in hand; and in performing his great task, he is not to forget that it is not he, but nature that operates; — regard nature, be always guided by her, and never interfere to disturb her.

With this introduction we propose to give our views of therapeutics, and in doing this we shall consider it under the three heads named above. First, the general *pathology* of disease. Second, the means by which nature removes disease. And third, the mode in which agents act upon the system.

DISEASE.

Disease is a departure from health. The first study of medicine—anatomy—gives us a knowledge of healthy structure. The second study of medicine—physiology—notes all the activities of this healthy structure under normal conditions, and gives us a standard of healthy function. From this standard of structure and function we make the measurement of disease.

It may be well to understand first of all, that the diseased man is in a worse condition than the well one. To the extent of his disease he is incapacitated for his work, and his sensations are painful instead of pleasurable. He loses his flesh, his strength, his functional activities, and is below his normal condition. He who fails to recognize that disease is a wrong life, and that impairment and debility are its essential features, has no business to practice medicine.

We say of the healthy man that he is able to do a man's work in the world, and do it pleasurably. We say of the healthy part, it is able to do the work of the part, and do it pleasurably. When a man can not do his work he is sick; to the extent that he can not do his work, is the gravity of his sickness. When his efforts to do the things he has been accustomed to are unpleasant or painful, he is sick, and the extent of the unpleasantness is frequently the measure of the disease. When an organ or part can not do its work, it is sick, and the extent of the impairment is the measure of the wrong. When an organ or part gives unpleasant or painful sensations, it is sick, and these are also the measure of disease in some cases.

In thinking of disease as a wrong life, rather than something that has taken possession of a man—that he has caught, or that has caught him—we have made an important advance. It is his life that we have to deal with, and it is his life impaired. It is death that we meet in the sick chamber. To the extent and gravity of the disease, death is taking the place of life. Death comes in the impairment of structure and function; life comes with its restoration to the normal conditions. We should be conservers of the life, and to do this we should restore the conditions of health, in so far as we have control over them.

Thus we might write our first therapeutic axiom as follows: *In disease there is always impairment of life, therefore remedies should always conserve the life, and increase the patient's power to resist disease, and regain his normal condition.*

In our study of disease we do not forget that there may be a present *cause* which should be removed. We see a man crossing the street with a burthen, then slip and fall. He asks our assistance to rise, but he is weighed down with the load which has fallen on him. Will we pull his arms out in an effort to raise him? or curse him, kick him, and cuff him, to stimulate to renewed effort? Or will we lift off the load, and then give him a hand? It is a very homely simile, yet it presents the matter in a fair light.

A patient is suffering from diphtheria, smallpox or typhoid, in a dark, ill-ventilated room, or a house permeated by sewer gas. A person is developing a phthisis pulmonalis in a low, damp and dark locality. A patient is doing badly, with dirt, bad air, insufficient food, want of rest, etc. A man has grown a nervous dyspepsia and a dyspeptic nervousness by the abuse of tobacco. A woman is exhausting her little stock of life in frequent child-bearing or prolonged lactation. A woman or man is exhausting his or her little stock of life in marital excesses. People are exhausting their digestive powers and growing confirmed dyspepsia, by bolting their food without chewing. What shall be done with them? Which is the first step towards a cure? These are common examples, and every reader can multiply the instances given; and as he does, he will see clearly the necessity of removing the cause of the wrong. The causes of disease are many, and the means of removal are many, but to the thinking physician the problem soon solves itself.

If we found a patient with a thorn or splinter in his hand or foot, it would be good practice to remove it. If we find a worthless tooth a cause of persistent neuralgia, it is good practice to extract it. If we find a woman suffering blood poisoning from a retained placenta, it is good practice to effect its removal. In the same way, if we find a patient suffering from unpleasant accumulations in the stomach, which are a source of irritation, and by decomposition cause blood poisoning, it is good practice to give an emetic and remove them. If a patient is suffering from accumulations in the bowels, a cathartic for removal is good practice. If, from arrested secretion of the skin, the blood contains effete material, a cause of disease, it is good practice to stimulate the skin to increased activity, and effect its removal. In like manner, if the kidneys fail to remove their part of the waste, and its retention is a cause of disease, diuretics are rational remedies.

The reader will see that these are the results of applied *common sense*—the sense we find best adapted to the ordinary affairs of life. The matter is plain to the simplest mind—there is a known cause of disease present, there are direct means for its removal, and with its removal the living body regains its normal condition. It is the load which prevents the man from rising; you take it off, and he is able to get up.

In other cases we do not remove the cause directly, but we neutralize it so that it is no longer noxious and disease-producing. In toxicology we might illustrate it by arsenical, lead, and oxalic acid poisoning. The patient has taken arsenious acid, we give him hydrated sesqui-oxide of iron, and in arseniate of iron we have lost the poison. The patient has been poisoned with lead, and we give iodide of potassium, and in iodide of lead we have lost the cause of disease. The patient has taken oxalic acid, and we give a preparation of lime, and with the change to oxalate of lime the injurious influences cease.

Our patient has ague or other *periodic* fever; we give quinine, which neutralizes the cause, and the fever ceases. He is influenced by a zymotic cause, and has the evidences of blood poisoning; we give the proper anti-zymotic, and we arrest the process. The tongue is pallid and dirty, and we give sulphite of soda; it is red, and covered with a glutinous nastiness, we give sulphurous acid; it is red, dry, and brown, we give muriatic acid. The patient gives an unpleasant fetor, like decomposing flesh, and we give chlorate of potash. Or the tongue may be broad and pallid, showing acidity, and a solution of bicarbonate of potash gives relief. Or it may be deep or dusky-red, showing alkalinity, and an acid proves the remedy.

There are special causes of disease, for some of which we know the antidote or remedy, but for others it is yet unknown I have named quinine for that which is usually known as *malaria*, and is marked by periodicity. Tincture of muriate of iron is quite as certain in some phases of erysipelas, and Rhus in other cases. Phytolacca meets the poison of diphtheria in the majority of cases. Sulphide of calcium for the condition of furuncular inflammation, or inflammation of cellular tissue with low grade of deposit.

The entire system of antiseptic surgery is based upon this principle. The atmosphere is loaded with germs which favor sepsis and putrescence, if they are not the cause of it. That a wound do well these germs must be excluded, or their putrescent activity destroyed by antiseptics. If, as in the olden time and now in minor wounds, the cut is bound up in its own blood, and as it were hermetically sealed, the process of repair goes on kindly. Or if a surgical operation is performed with antiseptic precautions, and covered with an antiseptic dressing, the repair goes on without disturbance.

If further investigations should prove that some diseases are due to these micro-organisms, as has been so stoutly affirmed, then the province of medicine will be to protect against the contagium, and employ means to destroy and remove the organisms. The recent experiments of Koch would suggest antiseptic inhalations and respirators in phthisis, and in the lower grades of pneumonia, and we await further study to determine the advantages to be obtained in this way.

These are not the only examples that might be given, and it is well for the reader to look the entire field over carefully. He might think of syphilis and the syphilitic virus, which infects the lymphatic system and poisons the springs of the blood. For this we have as yet no antidote, though in the good time coming it will probably be found. An enlarged spleen may be the cause of imperfect blood making or of leucocythemia. A failure of the pancreas from low inflammatory action or change of structure, may so impair blood making and the nutritive processes that the person can not live. The virus of small-pox, scarlatina, whooping cough, typhoid and typhus fever, and other diseases of like character, must find antidotes in the future.

We may put the matter in the form of an axiom—*If the cause of diecase is present it should be removed or neutralized, unless such removal by remedies is more dangerous to the life of the patient than its continued presence.*

Can we see in these methods a rational use of medicines, and that for the administration of every drug, and for every other procedure, we must have a reason? Why do we give an emetic in disease? Is it because it was given by Dr. Thompson, Dr. Beach, Dr. Jones, or some other man? O no! it is because in this particular case we see the evidences of unpleasant material in the stomach, which acts as a cause of disease. Smith is attacked with fever to-day, and we give him an emetic with most marked success. Thompson has a fever next week; shall we give him an emetic because it benefited Smith? Not unless he shows the same evidences in a broad and loaded tongue, and full, oppressed epigastrium.

Shall we give cathartics to all patients merely because they are so "highly recommended," and have been used with benefit by Wood, Pereira, Copeland, Jones, and others? Not by any means; we use a cathartic because in this particular case we have the evidence that there is something in the bowels which is a source of irritation and a cause of disease.

Shall we give quinine in all cases and in the extravagantly large doses that are recommended by nearly all the teachers of *regular* medicine? Not by any means; we give it because there is the distinct indication, *periodicity;* and if we do not find this indication, we do not give the medicine.

Shall we give morphine to relieve pain, because the mass of the profession use it so freely, or because writers testifiy that they "employ it with the greatest advantage", or it "has been found highly useful," etc. Not by any means; we prefer to look for the cause of the pain, and by getting rid of the condition of disease of which pain is a symptom, we get rid of the pain.

Our third axiom might therefore take this form—*We do not use remedies because they have been "highly recommended," or have been found useful in named diseases, by writers or teachers of medicine; we use them because in the particular case there are evidences of disease calling for the particular remedy. We do not prescribe at names, but for conditions; we are not governed by authority, but by observation and the simple ruless of reason.*

Having given some thought to the "cause" of disease, and the necessity of its removal, we may study the "effects" upon the human body. The relation between cause and effect is just as absolute in disease as elsewhere in nature. There is no effect without a sufficient cause, and there is no particular effect without its particular cause. It is true that what seems to be effect, does not always cease when the cause is withdrawn. An injury is done the structures of the body—and until complete repair has been effected, there can not be normal functional activity.

The derangements of structure and function following causes of disease are multiform, because the body that is impressed is a very complex structure. A recent writer, speaking of this, says of the head of a spermatozoon—if you will imagine this as large as the Great Eastern, and filled with machinery as delicate as the finest watch, you will only approximate the delicacy and complexity of structure. Organic forms are wonderful creations, and it is well to get a conception of them. Last night I had on the page of my book an insect so small that I strained my eyes to see it—the point of a pin would cover it, yet this creature had six legs, with five perfect articulations each, muscles to move them, antennæ more flexible and with a finer sense than an elephant's trunk, wings with powerful wing muscles, a skeleton, feathers, a complete digestive apparatus, a nervous system, and an apparatus of procreation. It is a fair example; think of every part of the human body as composed of a like minute and perfect structure. You have heard some mean persons' souls described as "that thousands of such might dance on the point of a cambric needle." Of the living molecules of the human body, millions might play in the same space.

But with our gross senses we can not take cognizance of the wrong of these minute structures. We may agree with Virchow, that all functional activity springs from cells, and that all abnormal life (disease) is due to wrong of the living cells. We may go further and agree with Grauvogl, that all life is due to the movements of the molecules of living matter, and disease must be due to changes of these molecules. But as they are so far beyond our senses, the knowledge is of no practical benefit.

Only this thought will suggest itself. If the basis of our tissues are thus minute, and the structures so fine and complex, is there good reason why we should rely upon such gross remedies, and such violent effects. Will a watch-maker repair a watch with a sledge-hammer.

Practically it serves our purpose better to divide the body into a few principal parts, having somewhat distinct functions, and study these. For a full consideration of this subject the reader is referred to my *Principles of Medicine;* here we will make but a brief synopsis of the subject.

The Forces of Life.—Having a body, it must be set in motion and kept running, for the motion is life. Movement necessitates force, and we have to learn how this body receives force from without, liberates it for its varied movements, and regulates it for its normal uses. This force is one, but as it manifests itself in different ways, it is of advantage to study it as formative force, heat, and electricity.

These forces are also conditions of life. The impulse (formative), from the parents, is to a certain extent the measure of the life of the child, both as to its activity and duration. A temperature of 98° is indispensable to healthy life—if it is increased, the person is sick. A certain amount of electricity is necessary to healthy life; if it is deficient there will be disease, if it is in excess there will be disease.

Measurement of Disease.—This brings us to the consideration of the common rule for the measurement of disease, and for the application of remedies. Disease is either an *excess, defect, or perversion*. There may be an excess of structure, defect of structure, or perversion of structure; an excess, a defect, or a perversion of any function.

If there is an excess, such remedies should be employed as will lessen or remove it. If there is a defect, such remedies are to be employed as will increase or restore it. If there is a perversion, such remedies are to be employed as will rectify and bring back to a normal condition.

The Conditions of Life.—It is a first duty of the physician to see that the conditions of life are right. A well man may live and even enjoy comfortable health under very bad conditions, because the human body has great adaptibility, and power of resisting unfavorable impressions. But the sick have lost this resisting power, and bad conditions of life may cause a disease to prove fatal that in other circumstances would terminate in health.

The first group of conditions are—light, air, exercise, food. If we use the prefix " good," we will express right conditions, as good light, good air, right exercise, good food. If these conditions are wanting, they must be obtained.

Division of Function—As we continue our study, we find that the organs of the body group themselves into a *digestive apparatus*, a *blood-making apparatus*, a *respiratory apparatus*, an *excretory apparatus* (skin, kidneys, bowels), an *apparatus for reproduction*, and a nervous system, an *apparatus for innervation.*

The selection of food, its preparation for use, its mastication, insalivation, gastric digestion, and intestinal digestion, is the study of the first, and a study that can not be too thoroughly made. The food is the life of the man. It furnishes the material for the continuous renewal of the body, without which the man would die, and it furnishes the force which gives activity to all parts of the body, and a surplus for the world's work.

The apparatus of blood-making is not as thoroughly studied as it should be. The lacteals, the mesenteric glands, the entire lymphatic system with its glands, the ductless glands (spleen, thyroid, thymus, and supra-renal capsules), the pancreas, and especially the liver, are all to be looked over in this study. Wrong of any part may cause a wrong of the blood, a wrong of nutrition, and a wrong of structure, with a still further wrong of function as a result.

The apparatus of respiration is essential to every moment of life. Stop it, and the life stops. Retard it, and the life is retarded. Impair it, and the life is impaired.

The excretory apparatus has offered therapeutists a fruitful field for study. The material of excretion is a tangible nastiness that impresses itself on the dullest minds. It looks bad, it smells bad, and without trying it one can readily say that it tastes bad, and it is something that people do not like to carry about their bodies, or come in contact with. Further than this, common experience has shown that it is disease-producing, whether retained in the blood, or re-absorbed after it has been excreted. There is nothing clearer than that this unpleasant matter should be removed from the blood, and we have large classes of remedies looking to this end.

The fact that human excretion is eminently poisonous when once out of the body, is not so well appreciated. True, people do not defecate or urinate in their clothing, but they sometimes do worse. They so arrange the place of deposit, that it filters into wells, cisterns, milk houses, cellars, and poisons springs and water courses. One would object if he saw his neighbor hang himself over the well-curb to defecate in the water, but the thing is done all the time, but in a more modest way. Human excreta in water, in milk (and the water cows drink), in food, is a common cause of diphtheria, typhoid fever, spotted fever, cerebro-spinal meningitis, Asiatic cholera, and the entire catalogue of zymotic disease. It is material to breed a pestilence.

The apparatus for reproduction and the perpetuation of the species, occupies a minor place in the study of medicine, but yet is one of great importance. It is at the bottom of many diseases of men, and the majority of the diseases of women.

What may we say of the apparatns of innervation further than it is nearly always at fault in disease. In some cases it gives the major wrong, in others it is secondary and small, but in all it needs to be studied with care. Through it we reach every part of the body, and can influence every function. With right innervation our patients readily recover, with wrong innervation they suffer and remain sick.

Structural Disease.—There must be change of structure for every wrong of function, but as before remarked we only notice the gross changes not the more minute ones. We find an increased nutrition, and a part or organ becomes too large, and we call it hypertrophy. We find an organ, part or the entire body, becoming too small, and we call it atrophy. Or we find the structures changing in quality or in form, and we call it perversion—degenerations, deposits, or growths.

I have made this brief review of the subject only to stimulate the reader to a thorough study of it. It furnishes the basis for a rational practice of medicine, stimulates to close observation, and to the careful use of remedies.

Expression of Disease.

It is a fact that disease has definite expression, which may be studied and learned. The same condition of disease will give the same expression, so that, having learned the language of disease, we have a certain guide in diagnosis. It will not be amiss in this connection to remind the reader of the absolute law that like causes produce like effects. If the symptom or expression is the effect, like symptoms must show like conditions.

It may be urged that the symptoms of disease are sometimes masked, or that the evidence of grave disease may be covered up by symptoms of minor wrongs (usually of the nervous system), or that patients and nurses may mislead the physician. This may be the case, but knowing the many deceptions which may lead him astray, the doctor guards himself against them. "He who is forewarned is thrice armed."

The common methods of diagnosis, which names diseases and classifies them, does not serve our purpose in therapeutics, however useful it may be in studying the natural history of disease. In this method the most diverse conditions of disease may be covered by the same name, and he who prescribes for or at names is sure to go wrong.

In modern therapeutics we associate certain remedies with certain expressions of disease, the remedy proving curative in such cases. Thus we say that a broad, pallid, and dirty tongue indicates a condition of disease which will be met by sulphite of soda; a dusky red, with brown coating, indicates a condition which will be met by muriatic acid; a bluish, full appearance of the face, like one who has been long exposed to cold, is met by baptisia; a pallid mucous membrane, with pultaceous or fibrinous deposit, is met by phytolacca; a small, frequent pulse is met by aconite; a full, frequent pulse is met by veratrum; a small, sharp pulse, with nervous hyperæsthesia, is met by rhus; dullness, disposition to sleep, coma, dilated pupils, are met by belladonna; distinct periodicity in disease is met by quinine, etc., etc.

How this relation between disease expression and drug action has been determined might be made an interesting study, if we had time. Suffice it to say, that much of it has grown from the observation of the effects of medicine when given in the ordinary empirical way. Careful observers have noticed that in some cases the medicine was markedly curative, whilst in others it was not. They would remark some peculiarity or special symptom in the cases benefited, and would afterward give the medicine where that peculiarity or symptom was observed; and thus the relation between such expression or symptom and the drug, would be established. In other cases the relation has been established by careful experimentation on the sick. Some peculiar action of the drug, or some special want of the patient would suggest a particular drug. It would be used again and again, until the relation between disease expresssion and drug action was established. In still other cases the relation has been established by proving the remedy on healthy persons, and determining by this its quality of action, and its affinity for special parts. This is the homœopathic method, and the law they insist upon is, *similia similibus*. But it is also the physiological method; for, the influence of a drug having been determined, as to its quality and selection of special organs, parts or functions for its action, the agent is employed when such action is required. A remedy being something which *opposes* disease, we are quite correct when we say it is *antipathic*.

It is well to bear in mind that a remedy is a force which opposes disease. It may not seem so when we take the material in our hands, and to all our senses it seems inert. But locked up in its molecules is a wonderful power, sometimes in the smallest compass, which is sufficient to change the entire current of life, and make it flow in a different direction.

LAW IN MEDICINE.

Whilst physicians have talked of "science in medicine," of "scientific medicine," they have held to the opinion that there was nothing more uncertain than medical practice. They have even gone so far as to say that in giving a drug no man could absolutely predict its effect upon the patient. The practice of the day has fully borne out the statement, for there is nothing so uncertain as the ordinary drugging; and of the work of the majority of practitioners we might assert with Oliver Wendell Holmes—"It would he better for mankind if all the medicines were at the bottom of the ocean, though it might be worse for the fishes."

We believe that we are reaching a reign of law in the medical profession, and to that end will make certain propositions which I hope may convince the reader, or at least cause him to look over the subject carefully.

1. The law is absolute that "like causes produce like effects," and is as true in medicine as it is throughout the universe.

2. A *cause* is a force which, acting upon matter, sets it in motion (or modifies its motion), or changes its form; and this motion or change of form we call an *effect*.

3. The *effect* follows the *cause*, but that which follows is not always to be regarded as the effect. The *post hoc* is to be distinguished from the *propter hoc* by careful observations of the force applied and the effect produced in different cases.

4. A medicine is to be regarded as a *force* which will modify motion, set up motion, or change the form of matter, in the human body. In these respects it is a tangible thing, susceptible of observation, and its action and result formulated. If any one is inclined to dispute that medicine is a force, let him take two or three grains of podophyllin, or a drachm of lobelia or jalap, and await the course of events. What is true of one remedy is true of all remedies, and violence or activity

through a large quantity, or by some specially acrid quality, is not necessary. A minute quantity of hydrocyanic acid, glonoine, or any of the more intense poisons, will prove this. It might also be proven by the fraction of a grain of syphilitic or small-pox virus, introduced into the circulation.

5. The force of a remedy is for the time being locked up in it, as is the case in coal, wood, gun-powder, nitro-glycerine, etc., and is set free in the body by decomposition or recomposition, as is the force in the articles named.

6. The *effect* is the motion or modification of motion, or change in the form of matter in the structure of the body; the result of the force of the medicine.

7. We employ medicines to cure disease, and we employ them because they contain a force which opposes diseased action, aids the body to remove disease, or aids the natural processes of life—all looking towards the condition we know as health.

8. Now we may postulate our problem thus: A medicine or remedy is a *certain* force, which acting upon a living body, is a *cause*, health, or some change looking toward it, being the effect. If one notices the proposition carefully, he will see that something is wanting, and that this something is the condition of the body which is to be acted upon. This we will call the "tertium quid," or the third element in a rational system of medicine.

9. With this we may make our problem read: With a known remedy and a known condition of the body, the result must be certain, for we have all the elements of nature's law that "like causes produce like effects."

10. The difficulty in practical medicine has been that we have worked with unknown quantities. Physicians have not known their remedies, and they have not observed the conditions of the body as determining the remedy, and the result has been uncertain and frequently unfortunate.

11. Let us consider again that medicine being a force, its action upon the body may not be towards health, but the reverse, even though under right conditions the medicine might be good. Steam as a force is a good and useful thing when rightly applied, but the piston that does good work in manufacturing is not so good when it crushes a man's leg or body;

or the steam which propels the boat is not so good when it bursts the boiler and blows up the people.

If now we take some examples from our every-day work we may see these abstract propositions easier. In all these matters one wants to see things clearly, and be able to prove them by his experience.

Let us take an ordinary problem in nature as an example of this method of reasoning. The earth moves around the sun in a definite orbit, which we are now able to measure with the same accuracy as a line of railroad from Cincinnati to Chicago. This has been determined, not by chain or compass, but by pure reason. This may be postulated in the following manner: *a*, the sun, as a force; *b*, the weight (specific gravity) of the earth; *c*, the attraction of other bodies in our solar system; *d*, motion in this well defined orbit the result. The earth has so moved as long as these conditions have existed, and will so move to all eternity, if the conditions continue to exist. It is only a fair example of the law that "like causes produce like effects."

Let the first example in medicine be—*a*, aconite, the force; *b*, a small frequent pulse, the condition of the body (tertium quid); *c*, the effect, health.

To put it in a different form let us say—*a*, aconite expending its force in lessening the frequency of the pulse and giving a right circulation, and reducing the temperature to 98°; *b*, condition of the body, a small, frequent pulse, temperature 104°, arrest of secretion; *c*, result, the pulse comes down, the temperature is reduced, and because of this, secretion and other functional activities are established, with a return to health. Aconite the cause, health the effect.

The second example shall be—*a*, quinine (the force); *b*, periodicity (the condition); *c*, health (the effect).

Any one who has had an experience with quinine, and has used it in a rational way, will see the truth of the eleven propositions in this example. Our patient may have an ague with its chill, hot stage, sweating stage, and intermission, repeated day after day. The periodicity (the condition) is marked, the remedy (quinine) possesses the requisite force, and the result is a cure. In a second case our patient has a severe fever, every function is deranged, and his life is impaired. We observe it closely and note the distinct remissions, and say "periodicity" (the condition), quinine (the force), and the result (effect) is health. Or, third, our patient has an inflammation of the lungs, every symptom being clearly pronounced; but, as we observe the case closely we again observe the exacerbations and remissions, and we say, periodicity (the condition), quinine (the force), the result health. You can multiply such cases from your experience.

Let us take as a third example—*a*, podophyllin (the force); *b*, full veins, full tongue, full face, full abdomen (the condition); *c*, health (the effect).

It will not do to mistake the condition with reference to the remedy. Thus we would make a very common mistake if we said "constipation" (the condition), for the patient might have a pinched face, small red tongue, and an irritable stomach and bowel, and the result would be, an increase of disease.

Taking this remedy again we might say—*a*, podophyllin (the force); *b*, fullness of face with dizziness and headache (the condition); *c*, relief from these unpleasant symptoms (the effect.)

As a fourth example we will say—*a*, sulphite of soda (the force); *b*, a broad pallid tongue, dirty (the condition); *c*, relief from all the disease (the effect).

Sulphite of soda has cured many different diseases—that is different according to the received nosology—but if the physician has noticed, they have all had something in common, and this something is the *broad, pallid tongue*, with a dirty coat. Not that it will cure every case with this symptom, for there may be something beyond this, or something additional may be necessary. While we cure some diseases with one remedy, a very large number require additional ones, for there are several things that need be done.

Baptisia gives us a fair example of—*a*, the force; *b*, a full purplish-red face, the expression of condition; *c*, cure, the result.

Take Gelseminum, the force; a flushed face, bright eyes, contracted pupils, restlessness, general headache, the expression of condition; the result, relief of unpleasant symptoms or cure.

Or, Macrotys the force; uterine pain, with sense of fullness and tenderness the expression of disease; result, cure or relief.

Or, Collinsonia the force; an uneasy sensation as of a foreign body in the rectum, with heat and contraction, the expression of condition; result, relief, and it may be cure. Of course this cure is usually one of hemorrhoids, but it may be something else, frequently ovarian or uterine.

Or, Santonine the force; retention of urine (acute, as in the fevers of childhood, or in women after childbirth), the condition; result the urine is passed.

Or, Belladonna the force; dullness, inclination to sleep, the expression of disease; result, relief and cure.

Or, Rhus tox. the force; frontal headache, starting in sleep, sharp pulse, redness of tip of tongue, the expression of disease; result relief, and cure.

I have given sufficient examples to show the application of the eleven propositions to the diagnosis and treatment of disease. The reader can follow it out at his leisure, bringing examples from experience to establish the truth of each one of them. Right reason is quite as profitable in medicine as in other professions or pursuits, and we will never have a "science of medicine" until physicians are willing to use it and rely upon it.

MODE BY WHICH THE NATURAL POWERS OF THE SYSTEM REMOVE DISEASE.

"There is," says Dr. Williams (Principles of Medicine, p. 38), "in organized beings a certain conservative power which opposes the operation of noxious agents, and labors to expel them when they are introduced. The existence of this power has long been recognized, and in former days it was impersonated. It was the *archæus* of Van Helmont; the *anima* of Stahl; the *vis medicatrix naturæ* of Cullen. But without supposing it to be aught distinct from the ordinary attributes of living matter, we see its frequent operation in the common performance of excretion; in the careful manner in which noxious products of the body, and offending substances in food, are ejected from the system; in the flow of tears to wash a grain of dust from the eye; in the act of coughing and sneezing to discharge irritating matters from the air-passages, and in the slower, more complicated, but not less obvious example of inflammation, effusion of lymph and suppuration, by which a thorn or other extraneous object is removed from the flesh.

"This *vis conservatrix* is alive to the exciting causes of disease, and in persons in full health it is generally competent to resist them. How it resists them will depend upon what they are. For instance, is cold the cause?—This throws the blood inwardly, which, by increasing the internal secretions and exciting the heart to increased action, establishes a calorific process which removes the cold. Is the cause improper food?—The preserving power operates by discharging this speedily, by vomiting or by stool. Is it a malarious or contagious poison?—It is carried off by an increase of some of the secretions. But if this resisting power be weakened, locally or generally, or if the exciting cause be too strong for it, then the cause acts, and disease begins."

It has already been stated that in many cases the natural powers of the system are sufficient for the restoration of health, and also that the physician who proposes to benefit the sick should carefully assist these efforts of nature. The question now comes up, how does nature remove disease?

In general disease we note the fact that the temperature comes back to the normal standard, the circulation of blood becomes normal, innervation becomes normal, secretion is established and effete material removed, digestion commences, good blood is made, and the tissues are rebuilded. In disease of parts it is very nearly the same. Wrongs of temperature are righted, a good circulation is established, imperfect materials are removed, and normal nutrition is established.

This seems to embrace the entire subject, and explains the method of cure in all forms of disease. For, with a right temperature, a right circulation, a right removal of waste, a right nutrition, and a right innervation, we must have health of the entire body, and of its parts. But if we examine it again and analyze it, it becomes more complex.

The temperature may be increased, diminished, or unequal,

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and arise from faults of food supply, respiratory wrong, wrongs of the skin, wrongs of innervation, or wrongs of the blood.

The circulation may be too rapid, too slow, too strong, too feeble, irregular, or changed from its normal character in a score of ways. And then these changes may be dependent upon wrongs of the blood, wrongs of the temperature, wrongs of innervation, wrongs of excretion, etc., etc.

The wrongs of innervation are multiform. Too much, too little, and perverted in a score of ways. We study these wrongs of innervation for years, and yet almost every week will show us some new phase of wrong innervation.

If we trace the course of any general disease where no treatment has been pursued, we will find that increased secretion and consequent elimination always precedes a change for the better; and the same is true where even the most opposite remedies have been used. Without this increased elimination does take place, death is inevitable. This accounts for the great success of Reformed Physicians in treating the common acute diseases of this country. Their attention has been especially drawn to the importance of due attention to these emunctories, and a large portion of the treatment is directly to stimulate elimination in this way. This will be apparent by a mere glance at the agents most used. In addition to this, the fact generally recognized by them, that in disease there is always a depression of the vital force of the system, and that this should be kept up by *tonics* and *stimulants*, has also added materially to their success.

With a return to a normal temperature, a normal circulation, a normal excretion, and a right innervation, the patient has a desire for food. Frequently the appetite is the best guide to the required food, and if not stimulated, or modified by suggestions, it may be safely followed. The food is digested as the stomach and intestinal canal gain power, good blood is made, and nutrition of tissue commences.

These are all natural processes, and even in severe and protracted disease, nature is able to accomplish it all. I have watched the case of typhoid fever go through all its phases without medicine, and on the twenty-first day terminate as above named—the restoration of a new body going on steadily until in six weeks the person would be as sound and able as before infection with the poison.

As we are taught to observe and follow nature's footsteps in these things, we use our remedies to facilitate what nature might accomplish without our aid. We do the things that she does. We do them in the same order, and we endeavor to do them in the same quiet way. In so far as we work with the vital powers, we are successful; when we oppose them we had better not practice medicine.

That nature is able to cure almost all curable diseases, is clearly proved by the results of homœopathic treatment. There are very few medical men who have any faith in the efficacy of their attenuations and dilutions, and yet we find that more favorable results are obtained under this treatment than under the old depletive system. This well-known fact is sufficient evidence that patients will get well without medicine, and that medicine said to be scientifically administered, is responsible for no small percentage of deaths under regular treatment.

As has been remarked, every part of the body and every function can be reached through the nervous system, and by small doses of remedies. Thus excess may be reduced, defects may be increased, and perversions may be rectified. And as the practitioner gains experience, he will find that he can accomplish these things with remedies that act kindly, that are pleasant in form and small in dose; and he will, from time to time, replace his old remedies with new.

Action of Medicines upon the System.

We might arrange all remedial agents in three classes, according to the effect they exert upon the system, whether it is *physical*, *chemical* or *vital*. All agents act in one of these three ways, though it is impossible sometimes to distinguish between them, as an agent may first affect the body by its physical properties, and secondly by both a chemical and vital change in some of its constituents.

Physical Effects of Remedies.—The action of remedies may be owing to their form; in this case we say the action is physical; but this is the case with but very few agents, and these are the anthelmintics: thus the hairs of the pods of *mucuna pruriens*, or the *stanni pulvis* of the pharmacopoeia, are said to act in this manner. These agents are supposed to act mechanically in destroying worms. All other agents that have been said to act in this manner, would produce no effect at all if they did not act in a living body; hence we may name such agents *physico-vital.*

Chemical Effects of Remedies.—According to Pereira, in consequence of the mutual affinities which exist between some medicines and the constituents of the tissues and of the blood, numerous and important chemical effects are produced in the animal economy. The *halogenous bodies*, some of the *combustible metalloids*, the *acids*, the *alkalis*, *metallic salts*, *tannin*, *creosote* and *alcohol* act in this way.

1. The *halogenous bodies* (*chlorine*, *bromine* and *iodine*) abstract hydrogen and unite with bases. Indirectly they become oxydizers by taking hydrogen from water and setting free the oxygen. In some cases they may, perhaps, combine directly with organic substances.

2. The *non-metallic combustibles* (sulphur and phosphorus) combine with both oxygen and hydrogen.

3. The *acids* (sulphuric, nitric, hydrochloric, phosphoric and acetic) combine with bases, decompose many salts, and unite with or decompose the organic constituents of the body.

4. The *alkalis* unite with acids, decompose some salts, and combine with or decompose the organic constituents of the body.

5. Most *metallic salts* react chemically on the organic tissues, and give rise to the formation of new compounds.

6. *Tannic and gallic acids.*—Tannic acid, in the impure state called tannin, acts on the animal tissues in virtue of its affinity for their constituents. It forms with albumen and gelatine compounds which are insoluble in water; and it also combines with fibrine. When taken into the stomach, it unites with the constituents of the epithelium, and of the mucous membrane of the alimentary canal. It becomes absorbed, and is evacuated from the system in the urine.

7. *Creosote, Alcohol and Ether.*—Both creosote and alcohol cause the coagulation of albumen.

In addition to the classes of agents named, there are but very few but what exert some chemical influence on the system. As a general rule, however, the beneficial effect of a remedy is not entirely dependent upon its chemical effect, but upon some change in the vital force of the system, so that we might justly call the action of this class of agents *chemico-vital.*

Vital Effects of Medicines.—The influence of all remedies upon the system must for the most part be vital in its nature, though it may depend in some part of its action on its physical condition, or on its chemical properties; its major action is such only as could be exerted in a living body. The class of vegetable remedies exert the least physical or chemical effect upon the system; they appear to act directly upon the vital force of the entire system, or on some particular organ or parts.

These remedies either stimulate or depress the functions of the different secreting and excreting organs, increase or diminish digestion and sanguification, stimulate or depress the nervous system, etc. They might be divided into three classes according to their effects upon the system, though such a division would but generalize the subject. The first of these classes would include all those agents which highten or augment vital action, and would hence be called *stimulants;* the second those that depress nervous action, or *sedatives*; and the third those that alter either the nature or quality of vital action, being neither stimulant nor sedative; this class might be called *alteratives.*

PARTS TO WHICH MEDICINES ARE APPLIED.

Medicinal substances are principally applied to the skin and mucous membrane; to serous membranes, to wounds, ulcers, etc., though in some few instances they have been introduced into the circulation by injecting the medicinal substance into the veins.

Application to the Skin.—Applications are made to the skin with a view to their local effect, as well as with a view to their remote influence upon distant parts.

Liniments, lotions, embrocations, fomentations, cataplasms, blisters, setons, issues, etc., are employed to relieve local painful affections, and to establish a new action and exert a derivative influence in deep-seated disorders attended with irritation, congestion, or local inflammation.

The methods of application are four, viz., the *enepidermic, iatraleptic, endermic,* and *hypodermic.*

The *enepidermic* method is that by which the medicinal agent is applied to the skin unassisted by frictions, as when we apply sinapisms, blisters, poultices, fomentations, baths etc.

In many instances the medicated vapor-baths, consisting of a solution of the volatile principles of either vegetable or mineral agents, afford much relief in cutaneous diseases, as well as in the diseased states of internal organs, mucous surfaces, etc.

Sinapisms, blisters and other *counter-irritants* are used principally for their revulsive effect; they give rise to a new point of excitation, and detract the circulation and nervous influence from internal organs to the surface. Though we can not analyze the *modus operandi* of this action, yet the fact (the main thing), is very apparent.

Poultices, fomentations, etc., are used to relax the parts to which they are applied, to apply heat or cold to a part, and to shield parts from the action of the air.

The *iatraleptic* method consists in the application of medicated substances to the surface, aided by frictions. It is also termed the *epidermic* method. Many substances are employed in this way, as liniments, ointments, etc.; also particular agents, as many of the narcotics, camphor, sulphate of quinia, aconite, belladonna, morphia, etc.

The *endermic application,* sometimes termed the *emplastro endermic* method, consists in applying medicated substances to the denuded dermis; the epidermis being removed by a blister.

The *hypodermic* method is an injection of the medicinal substance under the skin into the cellular tissue, from whence it is rapidly absorbed by the blood vessels. By this means any soluble substance may be directly introduced into the blood, and its action will be much more rapid than when taken by the stomach. Of course the remedies used in this way must be non-irritant, or else inflammation of the cellular tissue will result, followed by suppuration. The hypodermic syringe now made is a very perfect instrument, and can be used without the least danger, always avoiding veins.

Morphia is the remedy in most common use, and the solution employed is grs. x. to water ℥j. Atropia is used in the proportion of grs. vj. to water ℥j.; strychnia, gr. j. (sulphate of strychnia should be employed, and to the ordinary commercial article a small amount of acetic acid must be added); sulphate of quinia, grs. x. (three or four grains of tartaric acid is necessary to effect the solution); pilocarpin, grs. iv. Of these solutions the quantity used will vary from gtt. x. to ʒj.

Applications to the Mucous Membranes.—Agents are often applied to the different mucous membranes, as the *pituitary*, *trachea-bronchial*, *gastro-intestinal*, *recto-colic*, *urino-genital*, and *utero-vaginal* membranes.

Medicines are applied to the *nasal* or *pituitary* mucous membrane to irritate it, and excite an increased secretion, in disease of that surface and parts adjacent, when they are called *errhines*. The nasal douche and the spray apparatus are means of applying remedies to the nasal mucous membrane in cases of catarrh and ozæna.

Medicinal agents, when properly applied to the *trachea-bronchial* mucous membranes, are capable of exerting the most salutary influences. They are mostly employed for local purposes, as in phthisis, chronic bronchitis, asthma, etc. Numerous are the substances which have been applied to this membrane—nitrate of silver, sulphate of iron, cinchona, pinus canadensis, myrrh, etc., when reduced to an impalpable powder, have been inhaled in certain states of the pulmonary organs with advantage. The fumes of tar, resins, balsams, and various ethereal solutions, have been strongly recommended as inhalations in certain diseases.

The modern spray apparatus is the best means of applying remedies to the nasal, laryngeal, tracheal, and bronchial mucous membranes. With this the fluid is finely comminuted (pulverized), so that it is carried by the air breathed to all parts Several patterns of steam atomizers will be found in the market, the jet of steam from a small boiler carrying the medicated fluid. The air apparatus is simpler and cheaper, and will serve most of the uses in this treatment. Any agent that can be held in solution may be used in this way, and inhalations may be stimulant, sedative, alterative, tonic, increasing secretion, diminishing secretion, etc.

Simple aqueous vapor, and other medicated vapors are often highly useful in disease of the lungs and throat. The vapor may be inhaled through a teapot, or basin covere with an inverted funnel, or by inserting a tube through th stopper of a wide-mouthed jar containing the warm medi cated fluid. Narcotic and emollient agents are employed in this way; also, hot vinegar, sulphuric ether, camphor, tincture of iodine, tincture of conium, chlorine gas as it issues from moistened chloride of lime, etc.

Medicinal agents are mostly applied to the *gastro-intestinal* mucous membrane, which is termed the method by *ingestion.* From the great susceptibility of this membrane to impressions made by medicinal agents, and from the facility with which they are absorbed, and the nervous sympathy existing between this membrane and other parts of the body, it presents the most useful surface for the sanative application of medicinal agents. Their remote effects are more readily and more certainly secured than when applied to any other part of the system.

The *recto-colic* mucous membrane is readily affected by agents which are absorbed, as opium, tobacco, etc.; but twice or three times the ordinary dose is required to produce the desired effects.

Medicines are applied to the rectum to relieve disease in that or adjacent organs, as the bladder, uterus, or prostate gland; sometimes to secure alvine evacuations, by dissolving hardened feces, or exciting the peristaltic action of the bowels; sometimes with a view to their derivative action in diseases of the brain, and occasionally to remove the ascaris vermicularis, or small thread-worm.

If the substances applied to the rectum are solid, they are termed *suppositories;* if fluid, *enemata*, *lavements*, or *clysters.*

To the *urino-genital* mucous membrane, caustic or medicated bougies are applied; or anodyne, demulcent, astringent, or refrigerant injections are employed; and, in some cases, medicated fluids are injected into the bladder.

Remedies are applied to the *utero-vaginal* mucous membrane, to remove local disease, as in inflammation, morbid growths, etc.; they are also used to check excessive secretions, sanguineous discharges, and to promote the catamenial discharge.

ON THE MODE IN WHICH MEDICINAL AGENTS ACT WHEN INTRODUCED INTO THE STOMACH.

A legitimate, and by no means unimportant or uninteresting question, is, as to the mode by which medicinal substances act when introduced into the stomach, so as to remove abnormal states of the general system, or of particular organs. We will first look at their apparent effects, before examining the mode by which their action is effected.

Remedies may operate directly upon the organs diseased, and newly impress them,—change the morbid action present by substituting a new and different one that shall supersede or displace the primary affection; and by this means a cure is sometimes effected. Thus in dysentery, diarrhea, cholera morbus, nausea and vomiting, and many other disorders affecting specifically particular tissues, by exhibiting agents that exercise a specific influence upon the parts diseased, a new impression is produced corresponding with the morbid one already existing, though differing from it in kind and intensity of action, and by this means the original one is effectually removed. Indeed the substitution of a new action or impression in a diseased organ, often most effectually removes the primary one, and as soon as the part recovers from the temporary medicinal action, a normal state ensues. Although results of this kind do not always follow, yet the exceptions to this rule constitute no valid objection to the truth of the general proposition.

In this way cathartics prove beneficial in dysentery and diarrhea, emetics in cases of nausea and vomiting, and cantharides, turpentine, and other stimulating diuretics, in chronic irritation, or inflammation of the urinary organs. That other impressions and modes of action may follow the exhibition of these remedies, by which aid may be derived in subduing the morbid states, can not be doubted. Thus, they may excite the surfaces with which they come in contact to an increased secretion, and thus deplete the distended vessels, while the increased secretion may remove a noxious material from the blood, which has assisted to keep up the disease; the increased secretion may likewise shield, and thus lessen the irritability of the inflamed or irritated surfaces. The impression which they make upon other organs, or upon the general system, may also enable us to account in part for their sanative influences upon those tissues.

In the second place remedial agents may exercise a sympathetic influence upon the whole system. Some medicines act primarily upon the solids, and these impressions are transmitted through the agency of the nervous system to every part of the body. The remote effects of medicines are far from being confined to the parts with which they are brought into direct contact; on the contrary, parts distant from these are strongly influenced or impressed by remedial agents. Emetics, for instance, act primarily and specifically upon the stomach, but their most important sanative influence is transferred through nervous sympathy to other organs, and thus every tissue of the body is influenced or newly impressed by them; old associations and perverted sympathies are broken up, and a new action established, the tendency of which is, by this change of action and sensation, to restore the system to health.

The same remarks apply to cathartics. They act specifically upon the alimentary canal, causing alvine evacuations, and thus remove the vitiated and disease-creating accumulations of the intestinal canal—a prolific source of disease. But this is far from being the only way in which these contribute to the restoration of health. They excite the intestinal exhalents, and thus act as depletives, thereby promoting increased absorption and nutrition; they also exercise a strongly revulsive influence, by which a new surface or point of excitation is established, and by this counter-irritant effect, remote organs are relieved of congestion, inflammation and other morbid states. The whole system is impressed by their action, and important changes wrought upon the animal economy. Tonics and stimulants may act directly upon the sentient extremities of the nerves of the stomach, and thus arouse or excite that organ to increased energy, and thereby promote digestion; and thus favor the process of chymification and chylification, and by this means indirectly promote nutrition and the renovation of an exhausted or enfeebled system. By the agency of the same classes of medicines, a transmitted influence is extended through the nerves to every part of the body, and in this manner every fiber is newly impressed, and a modified state of the vital manifestations in every part of the body is the result.

In the same manner we may explain the therapeutic agency of other classes of agents in the removal of disease. In this way we may explain the highly sanative effects of ablutions—we apply them to the surface and the impression there made is transmitted to every portion of the system, and a general reaction results from a timely and appropriate resort to these means. The advantages attending their employment, often so conspicuous, can be explained only upon the ground that the new impression made upon the surface is transmitted by nervous sympathy to other parts of the body.

That the animal economy possesses the faculty of transmitting impressions, whether morbid or sanative, from one part to another is indisputable. This power is essential to the preservation of living beings, and the vital actions would soon cease, did not a connected medium exist, by which each part is brought into a reciprocal relation and mutual dependence upon others. The brain and nervous system constitute the medium through which these sympathetic phenomena are transmitted, and remedial as well as morbid impressions are propagated through this source to all parts of the animal economy.

Thus every therapeutic agent or appliance may be said to alter or modify the sensations, actions, functions or condition of some organ through this medium; their primary action may be upon particular parts, and remote from those over which they exercise an important curative influence, and this secondary influence may not be in every case immediately appreciable. How wonderful then is the bond of union which exists between the various organs of our bodies; that it does exist, does not admit of a doubt; that a reciprocal intercourse of relations, sensations, and sympathies is maintained between all parts of the animal economy is apparent. These links unite all parts of the system, and thereby establish that concurrence of action, and that perfect harmony of function, which when beheld, can not fail to strike the observer with wonder and admiration. In this way then are we enabled to explain many of the sanative influences wrought upon diseased organs or states of the system by the administration of medicinal agents.

Again, remedies may act directly upon the blood, either adding something to it, or modifying its constituents. We have a large class of agents termed *restoratives* that act in this manner; they are of great importance in the treatment of any disease in which the blood mass has lost its normal character. In health, food is the proper restorative, it supplies the blood with all its constituents, with all substances required to supply growth, to repair waste, and to maintain the various functions at the healthy standard. Disease may result from improper food, or want of assimilation in that which is taken, and thus we have as the proximate cause a defect of some of the constituents of the blood. We have a familiar example of this in Chlorosis or Anæmia; in both these diseases there is a defect in the quantity of the red globules of the blood. The treatment in this case should be directed to the restoration of the defective material; this is done by the administration of iron, which assists to form the deficient element. Again we suppose that the class of tonics add to the blood some vital constituent that is lacking; no one can have failed to notice the beneficial effects of this class of remedies upon the system: all of them are readily absorbed, and chemists inform us that they are not excreted, without they are taken in large quantities. This being the case, it is reasonable to suppose that they remain in the blood, and assist in supplying material to the various parts of the body.

Some agents exert a modifying influence on the blood, and on the system; these agents are generally termed *alteratives.* This class of agents we know less about than any other; there is no doubt that many of them owe their medicinal action to their effect as eliminatives, but their entire effect can not be ascribed to this cause, so that we must suppose a part of their action at least must depend upon their influence on the blood.

Again, some classes of agents owe their sanative influence to their eliminative action, either stimulating the excretory organs of the body to a normal performance of their function, or uniting with a morbid material in the blood, pass with it through an excretory organ, by virtue of their special affinity for it. To this class of agents belong cathartics, emetics, diaphoretics, diuretics, etc. They are used to remove morbid material from the circulating fluids. "To restore the natural secretion of a part when its diminution or stoppage results from torpor or deficient vascular activity of the secreting organ. To augment the natural secretion of a part, and thereby diminish the quantity of circulating fluid. To augment the natural secretion of a part, and thereby to promote absorption—as in dropsy. To augment the secretion of one part, and thereby to lessen the secretion of some other part. To augment the secretion of an organ, and thereby relieve local determinations of blood to remote parts; as when we administer purgatives to relieve determination of blood to the brain. To promote secretion, and thereby to favor the subsidence of diseases whose natural termination is by increased secretion. To produce exhaustion (the secondary effect of evacuants), and thereby to act as antiphlogistics."

In the further consideration of this subject, we will adopt the propositions of Headland, with some modifications, as the basis of our remarks. Perhaps no other writer has done more to unravel the intricate questions in regard to the action of remedies than this author, and we will quote freely from his work where his views appear to be founded upon fact or correct reasoning. He bases his views of the action of remedies introduced into the stomach, upon ten propositions These propositions relate to the general conduct of medicines after their introduction into the stomach, and before their absorption into the blood, and of their subsequent effects after they have passed into the blood. They are as follows:

PROP. I. That the great majority of medicines must obtain entry into the blood, or internal fluids of the body, before their action can be manifested.

PROP. II. That the great majority of medicines are capable of solution in the gastric or intestinal secretions, and pass without material change, by a process of absorption, through the coats of the stomach and intestines, to enter the capillaries of the portal system of veins.

PROP. III. That those medicines which are completely insoluble in water and in the gastric and intestinal juices, can not gain entrance into the circulation.

PROP. IV. That some few remedial agents act locally on the mucous surfaces, either before absorption, or without being absorbed at all. That they are chiefly as follows:

a. Irritant emetics.

b. Stomach anæsthetics.

c. Irritant cathartics.

PROP. V. That the medicine, when in the blood, must permeate the mass of the circulation, so far as may be required to reach the parts on which it tends to act. That there are two possible exceptions to this rule:

a. The production of sensation or pain at a distant point.

b. The production of muscular contraction at a distant point.

PROP. VI. That while in the blood the medicine may undergo changes, which in some cases may, in others may not affect its influence. That these changes may be:

a. Of combination.

b. Of re-construction.

c. Of decomposition.

PROP. VII. That a first class of medicines, called hematics, act while in the blood, which they influence. That their action is permanent.

1. That of these, some, called *restoratives*, act by supplying, or causing to be supplied, a material wanting, and may remain in the blood.

2. That others, called *catalytics*, act so as to counteract a morbid material or process, and must pass out of the body.

PROP. VIII. That a second class of medicines, called *neurotics*, act by passing from the blood to the nerves, or nerve-centers, which they influence. That they are transitory in action.

1. That of these, some, called *stimulants*, act so as to exalt nervous force, in general or in particular.

2. That others, called *narcotics*, act so as first to exalt nervous force, and then to depress it, and have also a special influence on the intellectual part of the brain.

3. That others, again, called *sedatives*, act so as to depress nervous force, in general or in particular.

PROP. IX. That a third class of medicines, called *astringents*, act by passing from the blood to muscular fiber, which they excite to contraction.

PROP. X. That a fourth class of medicines, called *eliminatives*, act by passing out of the blood through the glands, which they excite to the performance of their functions.

The first proposition affirms that the great majority of medicines must enter the blood before they can exert their peculiar influences upon the system. That this is true is readily proven by the fact that medicinal agents introduced into the stomach disappear, and no trace of them can be found in the alvine evacuations, unless they are agents which act specifically upon the alimentary canal. It is proven by the action of remedial agents upon the child at the breast, showing that the remedy has been absorbed, and that the milk of the mother has been medicated, it being rendered purgative by senna and narcotic by opium. Rhubarb in the secretions, madder in the bones, silver in the skin, and mercury in various parts of the body, when these agents have been administered, are additional examples going to prove the same proposition. Again, the odor of musk, garlic, onions, and various other agents, is readily detected in the cutaneous excretions, and in the breath. The coloring matter of indigo, iodine and madder is recognized in the milk, and the same principles, as well as the chemical constituents of agents almost without number are readily detected in the urine.

It is said that the *amanita muscaria*, a species of fungus, produces inebriation, and that the inhabitants of Northern Asia use it for this property. He who has eaten it will, in the course of twenty-four hours, have slept himself sober; when if he takes a teacupful of his urine, he will again become intoxicated; and a party of drunkards, it is said, may keep up their debauch for an indefinite period of time by drinking the urine of each other—one only having eaten the fungus.

That medicines act after having gained entrance to the blood, and that this is requisite to their action, is proven by the fact that remedies act in the same way when introduced into any other part of the system, or by being injected into the veins, as they do when introduced into the stomach. Thus iodine injected into the scrotum, for the cure of hydrocele, has been detected in the urine. Croton oil, or a liquid preparation of gamboge, jalap, or rhubarb, rubbed in sufficient quantity upon the abdomen, produces purging. A moistened leaf of tobacco applied over the radial artery, has been known to produce vomiting. A solution of aconitina applied to the skin, will produce numbness and tingling of distant parts. When medicinal substances are injected under the skin, they produce the same effect as when introduced into the stomach: thus, emetic substances produce vomiting; castor-oil, purging; opium, or its active principles, narcosis; strychnine, convulsions, etc.

It is proved that remedies must act through the blood, and not through the medium of the nerves, by the direct experiment that a poison will not act when introduced into the body, if the circulation from the part is cut off. Or the reverse experiment of Magendie proves this position. He introduced into the crural artery of a dog, the barrel of a small quill, upon which he fixed the vessel by two ligatures; the artery was divided in a circular direction between the two; he then did the same with the crural vein; thus all communication between the thigh and the rest of the body was interrupted, except the arterial blood, which passed to the thigh, and the venous blood, which returned from it. The poison introduced into the part produced its effect in the ordinary time—about four minutes. In this instance there could be no doubt but that the poison was absorbed by the veins, and through them carried into the circulation, from which it acted.

The objection that some agents act so rapidly that there is not sufficient time for their absorption and conveyance in the the circulating fluids to the part on which they act, is also removed by direct experiment. Mr. Blake made an experiment on a dog in order to test the rapidity of absorption: he placed half a drachm of hydrocyanic acid on the tongue of the animal, having first fitted a tube into the larynx, so as to prevent the vapor from passing into the lungs; he found that fifteen seconds elapsed before any morbid symptoms appeared, and death did not occur until forty-five seconds after the exhibition of the poison. Mr. Blake also found that a chemical agent would traverse the entire circulation of a dog in nine seconds, and of a horse in twenty seconds; so that sufficient time elapses for the absorption and conveyance through the system of even those agents that act with the greatest rapidity.

The second proposition states that the great majority of medicines are capable of solution in the gastric or intestinal secretions, and pass without material change, by absorption, into the capillary veins of the stomach and intestines. That they do this is proved by the facts already stated, but the question is, how is it accomplished? The physical agency by which absorption is accomplished (*imbibition* of Magendie, or *endosmosis* of Dutrochet), consists in the tendency of *rarer* fluids to permeate membranes into cavities containing those of greater density. The circumstances which determine the passage of fluid through the coats of a vessel are principally five: 1. *The densities of the liquids.*—Other things being equal, the lighter of the two tends to pass through to the heavier, more than the heavier to the lighter. 2. *Their attraction for the intervening membranes.*—That one passes through most, which has the greatest affinity for the membrane. 3. *The affinity of the fluids for each other.*—A fluid passes through more rapidly when it is readily taken up and dissolved by that on the opposite side. 4. *The motion of the fluid on one side* promotes the passage through of that on the other, because it is carried off as fast as it permeates the membrane. 5. The last law is that *any pressure on the fluid on one side of the membrane* has a powerful influence in determining the passage of the current from that side.

Magendie demonstrated the fact that when there was vascular repletion, absorption was very slow; but by depleting the vessels, absorption became very active. In one instance he injected about a pint of water into the veins of a dog; and placing in the pleura a moderate dose of a substance with the action of which he was familiar, he found that its effects were not apparent until many minutes after the ordinary time. In another experiment he depleted the vessels by abstracting a half-pound of blood, and the effects which ordinarily did not occur until the end of two minutes, developed themselves in thirty seconds.

Remedies, however, can not be absorbed without they are first dissolved and held in solution. A large number of agents are soluble in water, and these are readily absorbed. Some are rendered soluble by the addition of an acid to the water, and as the gastric juice contains an acid we have here the materials for their solution. Again others require a fluid with an alkaline reaction; and passing down into the duodenum they come in contact with the bile, an alkaline fluid, and are thus rendered soluble. Albumen and like matters are rendered soluble by the action of the gastric juice. Thus a great majority of remedies are rendered soluble, and are then absorbed; but we have agents that are insoluble in any of these fluids, and these either pass through the alimentary canal without exerting any medicinal influence, or they act as irritants or sedatives to it.

The third proposition affirms that those substances that are insoluble can not be absorbed into the circulation. This is a generally admitted fact and needs no proof, as its affirmation would conflict with well-known physical laws.

The *fourth* proposition affirms that some remedies act locally on the parts with which they come in contact. Some of these agents act first upon the stomach and intestines and are then absorbed; others are entirely insoluble and after their action pass from the body with the feces. These agents may be classed as follows: 1. *Antacids*, 2. *Chemical Antidotes*, 3. *Astringents*, 4. *Anæsthetics*, 5. *Irritant Emetics*, 6. *Irritant Cathartics*, 7. *Agents which affect the process of Endosmose.*

1. *Antacids* are employed to neutralize acidity of the stomach; they combine with and neutralize free acids contained in this viscus; they are then absorbed. Pereira states that they

probably aid in the digestion and absorption of fatty substances, especially when there is a deficiency of bile and pancreatic juice.

2. *Chemical Antidotes* are used to counteract poisons by rendering them insoluble, or converting them into harmless substances.

3. *Astringents* exert their effect locally as styptics, checking hemorrhage from the stomach.

4. *Anæsthetics* are employed to relieve gastrodynia and other painful diseases of the stomach. They include hydrocyanic acid, creosote and tris-nitrate of bismuth, and probably some others. They act in the same manner as aconite or morphia in painful diseases of the skin, by paralyzing the sentient nerves of the stomach — this action depending on local contact. The first two are afterward absorbed; but the third is insoluble, and acts also as an astringent to the mucous surface.

5. *Irritant Emetics* act by producing local irritation of the mucous membrane of the stomach. The impression is transmitted to the spinal cord, and by a reflex action the muscles concerned in the act of vomiting are excited to action, to expel the offending substances. Such agents produce but little nausea, and unlike *specific* emetics, which act upon the stomach into whatever part of the system they are introduced, these act only when brought into direct contact with the mucous membrane of the stomach.

6. *Irritant Cathartics* act in a similar manner as the same class of emetics; that is by their irritant effects on the mucous membrane of the intestinal canal, they cause an increased secretion from that canal, and stimulate the peristaltic action. Their action differs widely from that of *specific* cathartics; for these latter, as castor-oil, aloes, rhubarb, colocynth, elaterium and others will act as cathartics if absorbed through the skin, or injected into the veins. Many agents act in both ways, that is, they are partially absorbed and exert their influence through the blood; but being slowly soluble in the fluids of the body they exert a direct, irritant effect upon the walls of the intestine. We have examples of this in the class of *resinous* cathartics — as scammony, gamboge, euphorbium, podophyllin, etc. These agents

are sometimes of great value in disease of distant parts of the system, by their *revulsive* or *counter-irritant* effect.

7. Some agents *effect the process of Endosmose*—they may increase the absorption of other agents, or they may cause an endosmose of the blood serum into the stomach and intestine, or they may entirely check the process of endosmosis. Pereira makes the following classification:

"1. *Substances which undergo Endosmose and Exosmose with the Serum of the Blood.*—The kind of endosmotic influence which these bodies exercise varies, in many cases, with the degree of concentration of the solution. Very concentrated solutions in general cause endosmose of the serum; whereas dilute solutions have a reverse effect, and give rise to endosmose of the solution; and for solutions of an intermediate strength, the two currents are equal.

"*a. Substances which cause Endosmose of the Serum.*—This division includes concentrated solutions of various salts (phosphate of soda, nitrate of potash, chloride of sodium, iodide of potassium, tartrate of potash, sulphates of soda and potash, phosphate of potash and alum), native Seidlitz water, Pultna-water, sufficiently concentrated solutions of certain vegetable purgatives (manna and the extracts of senna, rhubarb, the herb mercury, tamarinds, cassia, colocynth and aloes, resins of scammony and jalap, and castor-oil), of various narcotic substances (one part of the alcoholic extract of the following substances to five parts of water: black hellebore, hemlock, henbane, aconite and belladonna), solution of cane sugar (this causes a very powerful current), dilute spirit, and a solution of cantharidin in olive-oil.

"*b. Substances which cause Endosmosis of the Solution.*—This division includes water (which produces the strongest current), dilute solutions of salts (phosphate of soda, nitrate of potash, chloride of sodium, and iodide of potassium), solutions of certain acids (acetic, tartaric, citric and sulphuric acids), of ammonia, of nitrate of strychnia, and of sulphate of quinia, hydrocyanic acid, laurel water, and certain non-purgative mineral waters.

"2. *Substances which do not undergo Endosmose and Exosmose with the Serum of the Blood.*—These may be arranged in two divisions:

"*a. Substances which penetrate the Membrane and render it unfit for Endosmose.*—To this division belong the solution of sulphureted hydrogen and decoction of tobacco. Under the influence of either of these liquids, the membrane becomes permeable, and yields to that liquid which exercises the greatest amount of pressure.

"*b. Substances whose presence puts a stop to the Phenomena of Endosmose, and renders the Membrane impermeable to either Liquid.*—To this division belongs the solution of hydrochlorate of morphia."

According to the generally received opinion of the laws of endosmosis, the purgative salts are purgative only because they are of greater density than the blood, and therefore cause an endosmose of the serum of the blood to the intestine, the increased distension exciting the peristaltic action of the bowels; hence these agents are generally hydragogue cathartics. This action is according to the law of endosmosis, that a fluid of great density, when separated by a membrane from one of less specific gravity, will cause an endosmosis of the lighter fluid.

This theory of the action of saline purgatives is adopted by Poiseble, Liebig, Matteuci, Dr. Pereira, and Dr. Golding Bird. They also contend that when these salts are much diluted they become diuretics and are excreted by the kidneys. On this point Dr. Bird states "that when saline substances, especially, are intended to reach the kidneys, it is necessary that the density of their solutions should be much below 1.028; the proportion of solids dissolved in the aqueous vehicles prescribed being always less than five per cent. Daily experience in the employment of remedies will show the importance of this law in a therapeutic sense. Thus a tolerably strong solution of the tartrate, or the acetate of potass, will altogether escape the action of the absorbents; indeed, so far from being imbibed by the capillaries, it will actually excite an exudation of water from these vessels into the stomach and small intestines, thus becoming diluted by exosmosis, a sensation of thirst is excited, by which the patient is compelled to drink for the purpose of supplying the water removed from the blood by exudation. In strong solutions, the salts alluded to stimulate the bowels and purge. They are moreover said to act as *hydragogue* purgatives, producing watery motions, a fact capable of ready explanation on physical laws; exudation of water from the exhalents (capillaries) occurring on account of the density of the saline solutions traversing the intestines. We can hence readily perceive why half an ounce of acetate or tartrate of potass will purge, and a scruple of either excite diuresis."

The *fifth* proposition states that medicines after they gain access to the blood, must permeate the mass of the circulation so far as to gain access to the parts on which they tend to act. This is proven by the fact that the agents may be detected in the different parts of the body, and in the secretions and excretions. We suppose that remedies have a special affinity for the parts on which they tend to act. As to the reason why particular agents act upon particular organs instead of others it is idle for us to speculate. Why do certain agents seek out and act upon the kidneys instead of other organs, and why do cathartics exert a specific influence upon the intestines, even though introduced into the blood vessels, or into some of the cavities of the body, or absorbed through the skin, and not taken into the alimentary canal? The reason we can no more explain than we can the reason why the planets are kept revolving in their orbits. If we are told that the movements of the planets are the result of attraction, so we may say that the determination of medicines to certain organs is occasioned by similar attractions. This, however, explains nothing, and we must after all, be content with the broad fact that such phenomena do occur, and that they are governed by certain laws; but the *cause why* they occur must forever remain concealed. As readily could we explain the reason why one plant possessing the most deadly poisonous qualities, and another that is not only innocuous, but delicious, and highly nutritious, should be produced from the same soil, both being placed in the same conditions.

The *sixth* proposition states that while in the blood, medicines may undergo changes, which sometimes affect the action of the agent, and at others do not. This proposition is too circumscribed for practical purposes; for instance, we administer a dose of some agent, we wish to know first, whether it is changed before being absorbed, as we know this does take place in some instances, and whether this change affects the action of the remedy or not; then we wish to know what changes, if any, take place while the agent is in the blood. We will first consider the changes that take place in the stomach.

According to Pereira, "Some substances undergo no obvious chemical change, but being liquid or soluble, mechanically mix with the fluids of the part to which they are applied and become absorbed, as venous *aqueous liquids*, holding in solution *coloring*, odorous and other matters."

Some substances undergo more or less chemical change by the action of acids, bases, salts, albumen, casein, ptyalin, pepsin, or other substances with which they come in contact; and the newly formed body is, if soluble, absorbed but not otherwise.

The *alkaline and earthy carbonates* are decomposed by the acids of the alimentary canal, with the evolution of carbonic acid.

Most of the *metallic oxides*, and the *metallic*, *alkaline* and *earthy salts*, form new compounds with albumen, casein, etc.

Chalybeate preparations, when swallowed, are partly converted into sulphuret of iron, which darkens the feces.

The *acids*, both inorganic and organic, combine with bases; and the salts which are thereby formed unite with organic matters.

After being absorbed, medicinal agents may be changed in their *combination*; they may be *reconstructed* or *decomposed*. Our knowledge, however, of these processes in the blood is not sufficient to elucidate any facts which would have any bearing on the action of remedies; neither can we tell whether an agent has been chemically changed in the blood, or in the stomach, or the excretions. We do know, however, that very few changes take place in the blood which affect the action of the remedy.

The *seventh* proposition maintains that a certain class of medicines, called *hematics*, act while in the blood, which they influence; and that their action is permanent. These agents are supposed either to add a material to the blood which was deficient, or to remove a material from the blood which was unnatural to it, or in some way change its character.

The first of these classes, called *restoratives*, embraces the most important agents of the materia medica; as already stated, they add to the normal constituents of the blood, and thus form a portion of the circulating fluid. They must then be such agents as would assist to form this fluid in a healthy state of the system, i. e., the blood must normally contain their analogues. It must not be supposed, however, that these agents are restorative in all conditions of the system, for the constituent of the blood which they increase may be in excess; hence a large number of them only prove restorative in certain forms of disease.

Headland lays down the following minor propositions in regard to their action:

"1. That they act in the blood, and that their effects are permanent.

"2. That there are naturally in the blood substances which resemble or coincide with them.

"3. That they are of use when a disease depends on the want of one or more materials in the blood."

The following classes of agents may be called restoratives in this sense: Tonics, chalybeates, acids, and alkalies.

The first class or *tonics* act first by increasing the tone of the stomach and entire alimentary canal; thus stimulating (though the effect is permanent) the process of digestion and assimilation, thus improving indirectly the quantity and quality of the blood. Do they do this merely by contact, acting locally, or are they first absorbed, then acting from the circulation? The bitter principles of agents of this class are almost invariably *alkaloids*, readily soluble in water, or in the gastric juice, and hence quickly absorbed, so that the contact of these agents with the surfaces of the alimentary canal is but of very short duration, and extends generally to only a portion of the stomach: this would tend to prove that they acted after being absorbed. By this stimulation of the digestive process we might account for the entire medicinal action of this class of remedies, as by this means they increase the quantity and quality of the blood, and the nutrition of the system; but we have reason to believe they do more than this. In miasmatic diseases, and fevers caused by the retention of an excretion, they are very efficient in counteracting the septic tendency of the morbid material. Is this action not owing to their counteracting the chemical changes going on in the body, in a similar manner to the action of hops in checking the fermentation of malt in the manufacture of beer?

In regard to the action of cinchona, which may be taken as the type of this class of agents, Sundelin observes: "The general operation consists in the *increase and exaltation of the tone of the irritable fibers of the vessels;* hence, by its use the pulse becomes fuller, stronger and regular, and the muscular power increased; also in the *general augmentation of the cohesion of the organic mass;* hence, it counteracts a tendency to liquefaction and disintegration, diminishes profuse secretions, which proceed from atony of the extremities of the vessels, and of the secerning surfaces and organs, and improves generally the crasis; and lastly, in the *augmentation of the vital energy of the sensible system.* By the last-mentioned property it restores sensibility, when defective or abnormally increased, and the property of reaction of the nervous system to their normal state, and augments the influence of this system on the muscular fiber, and on the reproductive system."

The different compounds of iron, or *chalybeate* remedies, act by directly supplying a material to the blood. They appear to be of benefit in but one condition of the system, that of *anemia;* and this disease or condition depends upon a deficiency of the red globules of the blood. The coloring matter of the red globules or *hematosin*, contains this mineral, and without a due supply of it the red globules can not be formed. Thus, by the administration of iron, the solid constituents of the blood in a case reported by M. Simon, had increased from 128.5 to 193.5 in 1,000 parts. The first effect of the iron is probably upon the red globules; it restores the deficient material, thus improving their condition, and by this means stimulates the entire system to a proper performance of its functions.

Acids prove indirectly restorative in some cases by increasing the amount of the acid in the gastric juice, as in cases of weak digestion depending upon deficient secretion of this acid. It may increase the acid of the gastric juice either directly or indirectly; it increases it directly by being added to it, indirectly by being absorbed into the blood where it would set free more of the acid than the stomach is required to furnish. If, however, there is too much acid secreted, these agents will cause indigestion; the same result will follow their inordinate use.

It is stated by Pereira that acids always combine with bases before absorption. Other authors suppose that they are absorbed as free acid; in either way, the alkaline base is derived from the blood, and hence they decrease the alkalinity of this fluid. The blood always has an alkaline reaction; hence there is rarely, if ever, a free acid in it. The beneficial effects of the vegetable and mineral acids in typhoid and other low forms of fevers, has been supposed by some authors to be owing to their neutralizing the excess of alkali, which existed in the blood in those diseases.

According to Headland, the beneficial effects of vegetable, acidulous drinks in febrile diseases, seems to be the restoration of the blood to a more natural condition, by supplying a material for oxydation. He says: "In fact, I suppose that in fevers the supply of the natural blood fuel is deficient; that the nitrogenous tissues are then oxydized to maintain the animal heat—causing not only wasting, but tending to keep up the fever by the excessive amount of oxygen demanded by this abnormal combustion; that in such a case the vegetable acid is well adapted to take the place of lactic acid, the natural fuel. For though in health the ingestion of such an acid is immediately followed by an increased acidity of the urine, when used in fevers it does not pass into the urine. It is then disposed of, or burnt, in the blood. The alkaline salt of the same acid is similarly burnt, as it would be in health; but it leaves a residue, an alkaline carbonate, which exerts upon the system the usual operation of an alkali."

Again, the mineral acids have been strongly recommended in phosphatic deposits from the urine; they are supposed to increase the acidity of the urine, and by this means the phosphatic salt is held in solution. On this subject Dr. Golding Bird says: "Unfortunately there is a great uncertainty attending their use; indeed, I feel almost inclined to question whether any of the mineral acids, except the phosphoric, really do reach the urine, and thus destroy its alkaline character; certainly in the majority of cases, even their continued employment appears to be utterly ineffectual in rendering the urine acid."

Alkaline agents prove restorative in those cases where there is a deficiency of these agents in the system, or an excess of acid; in the former case they supply the deficient material, and remain in the blood; in the latter they neutralize the excess of acid, forming salts, and are excreted from the system. They are also used to counteract the lithic acid deposit. They are supposed to be useful in rheumatism by neutralizing the acidity of the blood and the secretions.

The second class of hematic medicines, according to the proposition we are now considering, are called *catalytics* (from *Καταλυω, to loosen, break up, dissolve*), from their supposed action in destroying or counteracting certain morbid agencies. The term employed to designate this class of remedies is certainly no more appropriate than the one formerly used—the agents included under this head forming the old class of *alteratives*. The action of this class of remedies is so obscure that we will defer what we have to say upon them till we come to consider *alteratives* as a special class.

The consideration of the *eighth*, *ninth* and *tenth* propositions may well be deferred until we treat of the classes specified in them. The propositions themselves state all we know of their mode of action.

On the Art of Prescribing Medicines.

Independent of the knowledge of diseases and the treatment of them, says Dr. Thompson, much of the success of the practitioner depends on circumstances connected altogether with the form in which the remedies are exhibited. In prescribing a medicine, even the best calculated to fulfill the object of the practitioner, it is necessary to consider the age, sex, temperament, habits and idiosyncrasy of the patient.

before the dose can be properly apportioned; and, as far as the medicine itself is regarded, the most convenient and agreeable form of exhibiting it, whether it should be given alone, or combined with other ingredients, and how far these are likely to impede, modify, or facilitate its operation. An attention to these circumstances is absolutely requisite to prevent the errors which too frequently occur in forming a prescription.

FORMS IN WHICH MEDICINES ARE EXHIBITED.—Medicines are exhibited in the *solid*, *liquid* and *gaseous* state. *Solids* are employed internally in form of *powder*, *pill*, *bolus*, *electuary*, *conserve* and *lozenge;* and externally, of *cataplasm*, *ointment*, *cerate* and *plaster*. *Liquids* are employed internally in the form of *infusion*, *decoction*, *mixture*, *tincture*, *sirup* and *fluid extract;* and externally, of *baths*, *washes* and *liniments*. *Gases* are employed internally by *inhalation*, or by applying it locally to some of the mucous canals, as the vagina, rectum, etc.; externally they are applied in cases of local disease, or in the form of aqueous vapor to the whole surface, in cases of skin disease, or to produce perspiration.

Powders.—To form a powder, the remedy is finely comminuted, either by grinding, trituration in a mortar, levigation, elutriation, etc. It is the simplest, and perhaps the least objectionable form of preparing all remedies that can be reduced to powder; those agents, however, which are very unpleasant to the taste, those which deliquesce rapidly when exposed to the air, or are very volatile, or which are not readily diffused in water, can not with propriety be administered in this form. "Some substances can not be reduced to powder unless they be very much dried, and the heat necessary for that purpose alters their properties; even the impalpable form given to powders is injurious to some resinous substances, and we can not be surprised that a great alteration should be effected in a short time by the action of air on so great an extension of surface as takes in the operation usually adopted for reducing drugs to fine powder."

Many object to the employment of crude drugs in the form of powder, on account of the large size of the doses necessary, and from the fact that the woody and inert matter produces more or less irritation of the stomach.

The *active principles* of plants, as now obtained in the powdered form, are not liable to the above objections. The dose is small, there is no inert matter to produce irritation, and if the taste should be nauseous, it is easily disguised, owing to the small bulk of the agent.

Powders may be given in cold water, when they are readily miscible, and the taste is not nauseous; or in sweetened water. Resinous or heavy powders are best administered in mucilage or sirup; nauseous agents, if the bulk be small, may be enveloped in preserves, or administered in gelatine capsules.

Pills.—Pills are formed either of *extracts* having a proper consistence to take and preserve a rounded form; of dry solids which are combined with sirup, soap, extract of licorice, or some conserve, so as to form a pill mass; or of a tincture or fluid-extract combined with crumbs of bread, licorice, etc.

This form of administration is especially adapted for medicines which have a very nauseous taste or flavor, and such as require but minute doses to operate, or in cases where a slow action of the remedy is desired. They are objected to by many practitioners from the fact that a majority of patients have an aversion to pills, and because they are slow to act, not being as readily absorbed as when given in other forms.

Electuaries, Confections, Conserves.—Electuaries are mixtures of vegetable remedies, and light, earthy powders, combined by means of sirup or honey, so as to form a mass of tolerable consistence. Confections, or conserves, are vegetable matters beat into a uniform mass with refined sugar. In either case sufficient saccharine matter is employed to preserve as nearly as possible, the properties of recent vegetables, and prevent decomposition. In many instances this is a very available form in which to administer remedies, especially in the treatment of children. In some cases, however, the stomach will not tolerate the sugar, and in fever it is often detrimental to the patient.

Lozenges.—Lozenges, or troches, are powders mixed up with glutinous substances into little cakes, and afterward dried. They are adapted for the administration of remedies of a pleasant flavor, and especially where it is desirable to bring it in contact with the mouth, fauces, upper part of the air-passages, as in sore mouth, sore throat, coughs, etc. They are administered by slowly dissolving in the mouth.

We might here notice with advantage the two forms in which medicines are now so frequently exhibited—that of *extract*, and what are termed "*concentrated remedies*," or *proximate vegetable principles.*

Extracts.—Extracts are solid, or semi-fluid preparations, obtained by evaporating aqueous or alcoholic solutions of vegetable substances. When water is employed as the menstruum, they are termed *watery extracts*, and then consist of *gum*, *mucilage*, *albumen*, *extractive*, and *saccharine matter*, and such active principles as may be soluble in this fluid. They are generally very liable to decomposition, and owing to this fact, and that they contain large quantities of inert matter, the most of them are inferior preparations. When prepared with alcohol, they are designated as *alcoholic extracts;* and if water is employed in addition, *hydro-alcoholic extracts*. The two latter form when well prepared, and if the active principles are soluble in these menstrua, very efficient and eligible preparations.

Proximate Principles.—All vegetable remedial agents contain certain *proximate principles*, upon which the medicinal value of the agent depends. In these, when pure, there is no variation of strength, the physician knowing precisely when he prescribes them, how much medicine his patient will take, which can not be said of any other preparation. Of these principles we have the *alkaloid*, *resinoid*, *oleo-resinous*, *vegetable acids*, and *neutral substances*. Of these the two first are the ones in most common use. When "well prepared" they are, in a majority of cases, the best form in which vegetable remedies can be administered, "*but*" we have found by experience that it is not safe to take the word of every pharmaceutist who pretends to prepare these agents, that they are "*efficient agents*," or even that they are what they purport to be. We would be the last to throw discredit on concentrated medicines, yet we are confident that many inert agents, of this class, are palmed off upon the profession, greatly to the detriment, not only of the physician and his patients, but to the cause of reformed medicine.

Cataplasms.—Cataplasms, or poultices, are employed externally, to soften and relax the skin, and to exclude the air. They are formed of such substances as when wet will be somewhat tenacious, and accommodate themselves accurately to the part they are intended to protect. They may be employed solely with reference to the indications named, or they may be medicated by the addition of narcotic, stimulant, or other agents to the poultice.

Ointments.—An ointment is an unctuous substance, having a consistence but little firmer than lard, of which they are principally prepared. They are employed to bring medicinal agents in contact with the skin, by gentle rubbing, or more properly by inunction.

Cerates.—Cerates are unctuous compositions, possessing more firmness than ointments, on account of the wax which they contain, and from which they derive their names. Their consistence is such that they can be spread upon cloth, and thus form a dressing.

Plasters.—Plasters differ from cerates in possessing a much firmer consistence, so that the aid of heat is requisite to spread them, when they are pliable and tenacious, readily adhering to the skin. Each of these three forms of application may be employed to bring medicinal agents in contact with external parts, or through the skin to act upon internal organs; and, as it will readily be seen, one will be more applicable than another in certain cases.

Infusions.—An infusion is a solution of vegetable matter, obtained by maceration of the substance, either in cold or boiling water. A large proportion of vegetable remedies yield either a part or all their virtues to water by infusion; but in addition to the medicinal principles of the plant, water extracts the *gum*, *starch*, *mucus*, etc.

As far as success in practice is concerned, we have no doubt but infusion and decoction are the most eligible forms of administering such vegetable remedies as yield their properties to water. However much "*tea*" practice may be laughed at, we know that this practice has proven eminently successful in the hands of our old practitioners. In these forms the remedy is readily absorbed; there need be no doubt of its purity, or that it is well prepared; and again, it is certain in this case, that the patient will receive sufficient diluents, a matter that is of the first importance in the treatment of many diseases.

Infusions are objectionable, principally from the large size of the doses, and sometimes from the unpleasant taste of the remedy; the objection is also urged against them that they have to be often prepared, as they are liable to fermentation. Notwithstanding these objections we should prefer to administer remedies in this form providing the therapeutic properties of the agents could not be obtained in a pleasanter form. It may be supposed by the reader that this can be accomplished in every case, but our experience proves conclusively that some agents can only be administered in this form if we wish to obtain their full therapeutic action.

Decoction.—Decoctions are also solutions of vegetable matter in water, but they are obtained by boiling. They are intended to afford more powerful remedies than can be obtained by the simple infusion of the same substances in cold or even in boiling water; but, although by the operation of boiling, the solvent power of the water is increased, and a greater quantity of the soluble parts of any vegetable body are consequently taken up by it, yet it does not follow that the medicinal virtues of decoctions are greater than the infusions. On the contrary, if the active principles of a plant be volatile, or if they consist chiefly of extractive matter, this form of preparation often renders the remedy altogether inert, either by dissipating the volatile matters or by favoring the oxyzement of the extractive, which, in a continued temperature of 212° attracts the oxygen of the atmosphere so rapidly, that it is soon converted into a soluble, insipid, inert matter, and precipitated in the fluid. For these reasons only certain agents can be employed in this form with advantage, and it is an important point in studying the materia medica to impress the mind in regard to this point with any given agent.

Mixture.—A mixture in pharmaceutical language, is a preparation in which different ingredients insoluble in water are held in suspension by means of mucilaginous or saccnarine matter. It is a very convenient and desirable mode of administering many remedies.

Tincture.—Tinctures are spirituous solutions of such of the proximate principles of vegetables and animals, as are soluble in either pure or diluted alcohol. From vegetable agents submitted to its action, dilute alcohol takes up *sugar, resin, extractive, the alkaloid and allied principles, volatile oils, camphor, tannin, most vegetable acids, etc.*, and in addition more or less of the resinoid principle upon which the virtues of many plants depend. Alcohol undiluted is employed where it is desired to extract all the resinous principles of some agents.

Tinctures are the most eligible preparations of vegetable remedies, whether we have reference to their preservation, to the ease with which they are dispensed, or to their certainty of action. With the majority of remedies in common use, the tincture is now prepared so that the dose is very small, and dispensed with water, it may be graduated to the fraction of a drop. With a good sized pocket case a physician can carry thirty to fifty of these remedies, in quantity sufficient for two or three days' patients,—the only care being to renew the vial corks from time to time to prevent leakage.

In dispensing tinctures we usually call for a glass half full of water and a teaspoon. The few drops (v. to xxx.) are poured into a teaspoon and then into the glass. The dose is pretty uniformly one teaspoonful, repeated every one to three hours, as the condition of the patient may demand. I find that patients do not object to medicines, if they can see a clean tincture put into clean water, and there are but very few that have an objectionable taste, and none, the foul odor of the old-fashioned drugs. The child takes its medicine kindly, when it finds that the physician does not abuse its confidence by giving it a nastiness in disguise.

Sirup.—Sirups are saturated solutions of sugar in water, either simple or medicated by the addition of some vegetable principle. Medicated sirups, in the Eclectic pharmacy, are frequently prepared by extracting the medicinal principles of plants with alcohol, which is then displaced, and the residue is formed into a sirup. It is not a very eligible form for the administration of remedies, but it is very frequently employed to render more active remedies palatable.

Fluid Extracts.—"Fluid extracts," according to Wood, are "highly concentrated solutions of the active constituents of medicines or the active constituents themselves, extracted in a fluid form." The menstruum employed in the preparation of these extracts is diluted or undiluted alcohol, depending upon the character of the principles contained in the plant; in their preparation a portion of the alcohol is displaced, and its place supplied with sugar. According to the pharmacopeias, one pint of the extract should be equal to one pound of the crude agent; but many of the Eclectic preparations are three, four, or five times this strength, in fact, "very variable."

If "well" and "carefully" prepared, this might be a very available form for the administration of many agents, as the preparations are usually pleasant to the taste, and do not contain sufficient alcohol to make them objectionable. But, from our experience with fluid extracts we should hesitate to recommend the majority of them as "highly concentrated solutions of the active constituents of medicines."

Baths.—Baths are either simple or medicated; in both cases they are employed either to directly affect the skin, or for their influence upon a general disease. In addition to their value in diseases of the surface, it is sometimes a very valuable method of affecting the general system. Washes are solutions of medicinal agents in water or other menstrua, and are principally employed for their local influence.

Liniments.—"These are compositions which have the consistence of oil or balsam, so as to allow them to be easily rubbed upon the skin. They are generally more active remedies than cerates or ointments, and act as local stimulants, relieving deep-seated inflammations and pains."

Of the Form and Composition of Extemporaneous Prescriptions.—In every prescription, says Dr. Thompson, simplicity should be kept in view, and when one medicine will answer the intention of the prescriber, it ought to be preferred. The nauseous taste, however, and the other qualities of a great majority of drugs, require the addition of others to modify their action; but although medicines are more generally prescribed in a compound form, yet the practice of accumulating a great variety of ingredients in one prescription must be avoided.

Medicines exhibited in the fluid form operate sooner and with more certainty than in the solid state; but in choosing the vehicle or solvent, the taste of the patient ought not to be overlooked. Thus, for those to whom peppermint-water is not disagreeable, the nauseous taste of sulphate of magnesia is more completely concealed by that vehicle than any other; if cinchona bark in powder be ordered, milk effectually covers its taste, provided the dose be taken the moment it is mixed; and if aloes, the most nauseous article of the materia medica, be prescribed in a fluid form, a solution of extract of liquorice renders it by no means unpalatable. Medicines which, when given alone, produce griping, require the addition of aromatics to correct that quality; and when they operate with violence, mucilages and demulcents are sometimes necessary to soften their acrimony, or narcotics to moderate their action. In the use of concentrated remedies, especially resinoid preparations, it is of much advantage to triturate them with sugar or sugar of milk, not only for the purpose of rendering them more soluble, and thus increasing their activity, but also to prevent irritation of the stomach and intestinal canal. In prescribing cathartics, it is often important to consider the part of the alimentary canal on which we wish them to act. Thus, rhubarb, sulphate of magnesia, leptandrin, etc., act chiefly upon the duodenum; jalap, podophyllum and juglandin upon the lower part of the small and large intestines; aloes on the rectum, and bitartrate of potassa upon the entire length of the canal. Another reason for prescribing medicines in combination is the frequent need of fulfilling two or more indications at the same time. Thus, the same dose may be required in colic, to allay pain and evacuate the bowels, or in fever to determine to the surface, to allay irritation and produce sleep. But in combining medicines, care should be taken not to bring together *incompatibles*, or substances that decompose each other, or chemically combine, altering the nature of the mixture, and forming new compounds, which may be entirely different from the agents employed—without, indeed, the resulting compound is the agent desired. Thus acids and alkalis are incompatible, unless the neutral salt they produce be the remedy required.

The following are the objects to be obtained, says Dr. Paris, by mixing and combining medicinal agents:

OBJECT 1. To promote the action of the basis or principal medicine.

a. By combining the several different forms or preparations of the same substance.

b. By combining the basis with substances which are of an analogous nature, i. e., which are individually capable of producing the same or kindred effects.

c. By combining the basis with substances of a different nature, and which do not exert any chemical influence upon it, but are found by experience, or inferred by analogy, to be capable of rendering the stomach, or system, or any particular organ, more susceptible of its action.

OBJECT 2. To correct the operation of the basis, by obviating any unpleasant effect it might be likely to occasion, and which would pervert its intended action, and defeat the object of its exhibition.

a. By chemically neutralizing or mechanically separating the offending ingredients.

b. By adding some substance calculated to guard the stomach or system against its deleterious effects.

OBJECT 3. To obtain the joint operation of two or more medicines.

a. By uniting those substances which are calculated to produce the same ultimate results, but by modes of operation totally different.

b. By combining medicines which have different powers, and which are required to obviate different symptoms, or to answer different indications.

OBJECT 4. To obtain a new and active remedy not afforded by any single substance.

a. By combining medicines which excite different actions in the stomach and system, in consequence of which new or modified results are produced.

b. By combining substances which have the property of acting chemically upon each other; the results of which are:

1st. The formation of new compounds;

2d. The decomposition of the original ingredients, and the development of their more active elements.

c. By combining substances, between which no other chemical change is induced than a diminution, or increase, in the solubility of the principles in which their medicinal virtues reside:

1st. By the intervention of substances that act chemically;

2d. By the addition of ingredients whose operation is entirely mechanical.

OBJECT 5. To afford an eligible form.

a. With reference to its efficacy.

b. With reference to its taste or appearance.

c. With reference to its consistence or equable mixture.

d. With reference to its preservation.

In writing a prescription, the practitioner should, if possible, use pen and ink, and the name of each ingredient should be given at full length; or if abbreviated, the abbreviation should be one in common use, and which will be readily understood by the pharmaceutist. The prescription should, in every instance, be written in a plain, legible hand, with the symbols correctly given, and full directions as to dose and time of administration, and should be carefully re-read after it is written, in order to ascertain its correctness. In writing a prescription, the first object is the principal or most active ingredient, which is called the *basis;* the next, the *adjuvans*, or that which is designed to promote the action of the first; the third, the *corrigens*, or that designed to correct or modify the action of the principal remedy; and fourth, the *vehiculum*, or that in which the agents are to be administered. In writing a prescription, it is not always advisable to place the different agents in the order just named, but in the mode best fitted for compounding the medicine. Thus, salts and other soluble solids should be placed before the menstruum in which they are to be dissolved; and volatile agents should always be placed last, as they are necessarily the last ingredient added in the manipulation of the compound. When an infusion, decoction, or even poultice, is ordered to be prepared in the patient's house, it is always necessary to give specific directions to the one who is to prepare it; otherwise, in many instances, the remedy will be so poorly prepared, that no benefit will result from its use.

In country practice, where the practitioner furnishes the medicine, it should always be a rule to keep every thing in the office properly labeled, and never let a package of medicine be dispensed unless it is plainly marked with directions for use. An observance of the rules just laid down, though they may seem of minor importance, will sometimes prevent serious mistakes, and always show a laudable care for the welfare of the patient.

Circumstances connected with the State of the Patient.—Of these, we have to notice the *age*, *sex*, *temperament*, *habits*, *idiosyncrasy*, *disease*, *climate*, *mode of living*, *mental action*, and to some degree the previous diseases of the patient, as very important considerations in the administration of remedies.

Age.—In works on materia medica, the doses named, and the description of the therapeutic action of different remedies, apply to the treatment of adults, without the contrary is stated. As far as the dose of an agent is concerned we may, in most cases, consider the following table, originally drawn up by Gabius, as a sufficient guide for the young practitioner:

AGES.	PROPORTIONAL QUANTITIES.	DOSES.
For an adult, suppose the dose to be	*One*, or	1 drachm.
Under 1 year, will require only	1-12th, or	5 grains.
Under 2 years, will require only	1-8th, or	7½ grains.
Under 3 years, will require only	1-6th, or	10 grains.
Under 4 years, will require only	1-4th, or	15 grains.
Under 7 years, will require only	1-3d, or	1 scruple.
Under 14 years, will require only	1-2, or	½ drachm.
Under 20 years, will require only	2-3ds, or	2 scruples.
Above 21 years, the full dose.		
Above 65 years, the inverse gradation of the above.		

All tables, however, can be regarded but mere approximations, and can not apply to all remedies. Thus in early life the system is very susceptible to the action of narcotics, especially to opium, so that these agents if administered at all, should be given in much less than the proportionate dose;

while of castor-oil and some other agents much more than the dose named is required to produce their effects. Again, it must be recollected that in early life the mucous membrane of the stomach and alimentary canal is very susceptible to any cause of irritation, and hence irritant remedies should always be avoided. One of the authors, in his early practice, found that he met with much less success in the treatment of diseases of children than any other class of cases, and less than some of his professional brethren; he attributed it to the administration of such agents as were not readily soluble in the stomach. Convinced that such remedies did in many cases produce irritation of the gastric mucous membrane, with its train of unfavorable symptoms, he resolved that under no circumstances would he administer them, and by carefully selecting such remedies as would not produce irritation he has found infantile cases to yield as readily to treatment as any others. From one to three years of age we find a peculiar erythism of the mucous membrane of the alimentary canal, or at least an increased predisposition to irritation, which is undoubtedly the cause (providing we do not attribute it to the medication) of a large proportion of the mortality at this age. Here especial care should be used, not only in not giving agents which produce irritation, but in constantly guarding against it by the employment of such measures as we well know counteract it. We must also notice the fact of the acute, nervous sensibility of the patient at this time, and that very great advantage may be gained by impressions made upon the skin of a soothing and agreeable character. Hence it is that baths of various kinds at this age become among our most important means of cure. In old age it is generally stated that the doses of medicines should be decreased; but this is not on account of an increased sensibility to the action of medicines, for the reverse is the case; but because the strength of the patient is unable to sustain, without injury, the same impression from a remedy as in the full vigor of life.

Sex.—Although some females possess as much bodily strength and vigor of constitution as the majority of men, and require as large doses of medicine to produce a given effect, yet the greater delicacy and sensibility of the female frame, as a general rule, requires not only caution in apportioning the doses of active medicines, which should be less than those ordered for men of the same age, but the medicines themselves should be such as are likely to fulfill the indications required without much violence.

The state of the uterine system too must not be overlooked, for the periods of menstruation, pregnancy and lactation are attended with peculiarities in relation to the action of medicines. Thus the employment of aloëtic and drastic purgatives must be suspended during the catamenia and period of pregnancy; agents likewise which exert any powerful influence upon the system should not be administered at these times. Agents which are absorbed and communicate injurious properties to the blood, should be avoided during pregnancy and lactation; so too should all cathartic or other medicines which communicate their properties to the milk of the mother, while she is nursing.

Temperament.—It is doubtless true that temperament exercises a great and important influence over the action of medicines; yet temperaments are so poorly described, and the facts so illy defined in regard to their therapeutic relations that we are almost tempted to pass the subject by, as one that can only be learned by long practice. The *sanguine* temperament does not bear stimulants well, and is very readily affected by *quinine* and *morphia*, as is also the *encephalic;* while persons of a *lymphatic* temperament will generally require increased quantities of all remedies to produce a certain effect. We might consider the *bilious* temperament as the medium between the two named, the sanguine and the encephalic being more and the lymphatic less sensitive to the action of remedies.

Habit.—Under this head we shall consider only the previous habits of the patient in regard to taking medicine, and the influence that this will subsequently have in modifying the effects of remedies. Persons addicted to the use of spirits, narcotics and other stimulants, are less easily excited both by medical stimulants and narcotics; and the knowledge of the habits of a patient, as far as the exhibition of purgatives is concerned, is absolutely necessary for the prescriber—many people being in the almost daily habit of taking this class of remedies without consulting a medical practitioner. In the first of these cases, larger doses of stimulants and narcotics are required to produce the ordinary effects of those remedies; but in the second a change of the purgative usually taken will generally be sufficient. It should, however, be recollected that in prescribing a narcotic which has not previously been taken, the dose should be no larger than usual. In the employment of most remedies which require to be long continued, the dose will have to be increased in order to produce the necessary effect. In some cases, indeed, a remedy will entirely lose its influence upon the system, when by substituting another having a similar action, the full effect will be produced.

Idiosyncrasy.—The individual peculiarities, or as the term is, *idiosyncrasy* of patients to the action of remedies, is of much importance, and can not be too carefully considered by the physician. It is well known that many persons are peculiarly affected by substances taken into the stomach, either in the form of food or medicine, in a manner different from the majority of mankind. Such cases are generally only discovered by accident or time; but the practitioner called to attend on a patient for the first time, should always inform himself in regard to this particular as well as he can, never neglecting such information as may be volunteered by the patient or his friends. Any facts obtained in this way, or accidentally discovered, should be stored up in the memory for future guidance when treating the same patient. A physician who, from long attendance upon a patient, is thoroughly acquainted with all his constitutional peculiarities in regard to the effects of medicines, has much greater advantages in treatment than one who has all this to learn. Hence we have here a good reason for the preference of patients to their family physicians, and a strong reason against the very prevalent custom of many Eclectic physicians changing their location every year or two.

Peculiarities in the effects of medicines are sometimes generated by disease; a remedy having an entirely different action from what was expected, or even from what it had had at previous times.

As examples of these idiosyncrasies, might be mentioned the well-known effects of ipecacuanha, in causing in some persons, merely by its smell, severe asthmatic attacks; the cutaneous eruption sometimes produced by copaiba and the turpentines; and the very singular and inconvenient effects of opium and its salts, upon some persons, etc. In some instances the effect of the idiosyncrasy is to render the patient much more susceptible to the action of remedies; while in others it has a contrary effect.

Disease.—The character of the disease always has more or less effect in modifying the action of remedies. Thus the susceptibility of the patient to the action of medicines is sometimes greatly increased, while at others it is greatly diminished. Again, new susceptibilities are occasionally manifested, and effects wholly unexpected produced. Thus, in irritation or inflammation of the stomach, very minute doses of an emetic will act promptly, while in certain affections of the nervous system, as delirium tremens for example, it is hard to produce emesis with the largest doses of the remedy. In certain conditions of the brain, small doses of opium will excite to phrensy; while in others, as in tetanus, mania, etc., the largest dose will produce but little effect. In diarrhea opium checks discharges from the bowels, while in spasmodic colic it favors the action of cathartic medicines. Numerous other examples of this might be noticed; but in this place all that is necessary is to direct the mind of the reader to the fact, and the importance of bearing it in mind in the study of disease, and the agents to be used in combating it.

Climate.—Climate modifies the action of medicine by altering the condition of the system. Thus, in warm climates, the muscles, the heart and arteries lose power and tone, the textures become relaxed, perspiration is profuse, and internal organs, especially the liver, are too much stimulated by blood, which has lost more than usual of its water, and less of its hydro-carbon. Hence the importance of using with caution such remedies as act with harshness upon the alimentary canal, or upon the liver. There is also a marked tendency in diseases to assume a typhoid or adynamic form, which should teach us the impropriety of using agents which debilitate the system, and the absolute necessity of using such means from the beginning as will keep up the vital powers. In miasmatic regions, it will often be found that agents which prove curative in similar diseases in other parts of the country, will have but little, if any effect; the disease being controlled, if we may so speak, by the intermittent influence. Here the agents termed *anti-periodics* will produce effects that we would not expect in disease where this influence is wanting. The influence of climate in the production of disease, and the action of remedies has not as yet been sufficiently investigated, and we have not therefore the data to give, even if we had the space, a full account of its bearings. It is, however, a fruitful field of inquiry, and one the cultivation of which will add much to our practical resources.

Mode of Living.—This like climate modifies the action of medicines by altering the condition of the system. It would be impossible, however, in this place, to notice all its bearings; all that we wish to do, being to call attention to its existence. In persons of vigorous health and accustomed to out-door exercise, we find disease almost always assuming a sthenic type, and remedies, as a general rule, will have to be administered in larger doses to produce their effects. This is not, however, the case with cathartics, which, when they have not been habitually used, generally operate in small doses; while in persons of sedentary habits, we usually find habitual constipation; to remove which, larger doses of medicine are generally requisite. Extreme mental exercise predisposes to affections of the brain, and in disease of such persons care will be required to administer nothing that will increase this predisposition. Want of exercise and sedentary habits not only predispose to certain forms of disease, but likewise exert an influence upon the action of medicinal agents. Thus, if we except cathartics, remedies require to be administered in smaller doses, debilitating agents have to be avoided, and much care is requisite to support the vital powers of the system.

Mental Action.—There can be no doubt but that the state of the patient's mind materially influences the action of medicines. As a general rule, they will act with greater certainty and more promptly, if the patient knows they have been given to produce a certain effect. Indeed we have known effects produced from a harmless placebo, which were owing entirely to the mental impression that such results would occur. This, however, is not always the case; for instance, we order three or four doses of opium, one to be given every hour until the patient goes to sleep; the patient knowing the directions, the probability is, that the expectation and watchfulness for the next dose will prevent sleep until all are taken, though one dose under ordinary circumstances would have produced the required effect. Faith in the physician and the medicines administered, is often of more benefit than the remedies themselves. We have seen diseases treated without any benefit by one physician, when the same remedies continued under the direction of counsel in whom the patient had implicit confidence, produced the most marked beneficial effect. From these facts the reader will see the importance of gaining the confidence of the patient in all cases, but more especially in nervous and chronic forms of disease.

Previous Diseases of the Patient.—The character of previous diseases sometimes has an important bearing on the administration of medicines. Thus, to persons who have had chronic inflammation of the stomach, it would be injudicious to administer drastic or irritant medicines: the same may be said where chronic or recent acute inflammation of the small intestines has existed. Where a patient has been subject to hemorrhoids, although not existing at the present time, it would be highly improper to administer aloëtic or drastic purgatives. Where chronic disease of the kidneys has existed, we would be careful how we administered irritant diuretics, etc. All these circumstances in the previous history of the patient, should be inquired into and carefully weighed, and the exhibition of remedies governed accordingly. The great success of some practitioners depends in part upon the care with which they gather and consider all these circumstances; while the want of success by many is no doubt owing to their considering them beneath their notice.

The Preparation of Remedies.

Success in practice necessitates the employment of good medicines. Much of the uncertainty of medicine is due to the bad quality of the drugs sold in the market. When remedies are unreliable, the physician soon loses faith, and reaches the condition of a cathartic, quinine, morphine and whisky doctor. He fails so often with the medicines of the Pharmacopœia, that he deems it useless to study them.

It is true that the drugs of the market are adulterated in every possible way, and that preparations are of all degrees of worthlessness. Even chemicals must bear the name of some responsible house, and the cork sealed with their seal to give a reasonable assurance of their purity. Whilst with preparations of vegetable remedies it is still worse, and we can safely say that nine out of every ten are unfit for our use.

To have a good remedy from the vegetable kingdom it is necessary that it be gathered at the proper season, in the right locality, and that it be carefully preserved. With the majority of remedies it is necessary that they be prepared from the fresh crude material; as it is gathered, partly dried, wholly dried, but always recent. Some few may be dried and stored for future preparation.

We now prepare nearly all vegetable remedies with alcohol, and the larger number in the form of tincture (good fluid extracts are tinctures). That the physician may be certain as to the quality of these remedies when he makes his purchases, it is well that he should prepare some of them himself. Office pharmacy is profitable in this way if in no other.

It may be very simple. You gather the agent in the season when its virtues are greatest, pound it up in a mortar, if you have one, on a board with a hatchet or hammer if you have no mortar, put it in a glass or glazed vessel that can be tightly stoppered, cover it with twice its weight of alcohol (76 to 98 per cent. as the crude article contains resinous substances), and let it stand fourteen days. It is now ready for use. Pour off the tincture, express all you can get out of the drug, and if you want a very nice article, filter through paper.

Your Pharmacist turns up his nose at the crude process, but it won't turn up when he is shown the product and has it compared with the "fluid extracts" on his shelves. It is a sound and reliable remedy, and will give success in practice.

The process of percolation is a nicer method, and the one we advise, and it also is so simple that the doctor can hardly go astray in it. The crude material, if green or partly dried, is finely powdered up; if dry, is ground or powdered, and being wetted with alcohol is packed in a tin or glass percolator. The percolator may be a perforated diaphragm, or its lower part may contain tow; in either case it may be stopped with a cork. The material is now thoroughly wetted, and in twenty-four hours the cork may be removed, and the fluid allowed to pass through. Two parts by weight of alcohol to one of the crude drug is the proportion advised, and this may be poured into the percolator gradually, as the tincture passes.

The skilled pharmacist can prepare a fluid preparation which will represent the drug ounce for ounce. Yet the majority of preparations sold will not come up to the standard of eight ounces to the pint. What we care for first is the quality of the remedy, its strength is a secondary matter. Yet we want our tinctures as strong as may be, that it can be carried readily in our pocket cases.

Chemicals should be bought of well-known parties, and bear the label of a first class manufacturing house. If a medicine carries the name of such a house as Powers and Weightman, we feel satisfied with it. The sophistication is so great in the market that we can not trust others. I have seen Santonine sold that contained eighty per cent. of chlorate of potash. Morphia that was adulterated one-fourth, one-half, three-fourths, with cinchonidia; Quinine that was three-fourths cinchonidia; even bitartrate of potash would be one-half or two-thirds inert or foreign matter, and so all through the list.

It is advised that "proprietary articles," compounded articles, elixirs, peptics, and "fancy pharmacals" of all kinds be severely let alone. If the physician is capable of practising medicine, he is capable of selecting his own remedies, and making his own combinations for the case he has in hand. It is well, also, to look with suspicion upon "new remedies" advertised and pushed by manufacturing establishments. The introduction of a new remedy is the work of time, and it should come by and through physicians, not drug houses.

PART II.

SPECIAL THERAPEUTICS.

Special Therapeutics is that branch of medical science which treats of the application of special remedies in the cure or alleviation of disease. Under this head we will consider the different agents in classes, and the application of these classes in the treatment of special forms of disease, and then examine each individual agent in the same manner. It is not the intention of the authors to make what might be called a strictly scientific classification of agents, but to make such an one as they think will give the student and general reader the clearest view of the subject. The intention is to sacrifice every thing that is not strictly practical—to make the work a full, safe and reliable guide to the practitioner.

In the classification of remedies, those will be considered first that are most frequently indicated in the treatment of those diseases that make up the major part of daily practice.

The first general division may be termed *eliminatives*, from their principal influence upon the system—eliminating morbid materials from it. This will be divided into four classes. *emetics*, or those agents that produce evacuation from the stomach; *cathartics*, those that cause evacuation from the bowels; *diaphoretics*, those that cause an increased secretion from the skin; and *diuretics*, those that cause an increased secretion from the kidneys.

The second division may be termed *neurotics*, because their principal influence is exerted upon the nervous system. This will be divided into three classes: *sedatives*, or those agents that depress nervous energy, without producing any previous excitement; *narcotics*, those that first exalt and then depress nervous energy, and also produce sleep; and *stimulants*, agents which increase the evolution of nervous force. To this may be added a fourth class, termed *anæsthetics*, which render the patient unconscious of pain.

The third division embraces the internal remedies and local applications used for the purpose of reducing the temperature of the entire system or of a particular part. The class is termed *refrigerant.*

The fourth division embraces those agents which act principally upon the blood, and hence may be called *hematics*, or blood medicines. These may be divided into two classes—*tonics*, or agents that restore the normal quantity and quality of this fluid; and *alteratives*, those agents that alter, destroy, or remove any morbid material from the blood.

The fifth division embraces incidentally all those agents which act by revulsion, producing a new point of irritation, and directing to this the vascular and nervous afflux, and in this way relieving disease of more important parts. It embraces but a single class, which from their action take the name of *revulsives.*

The sixth division embraces but a single class, called *astringents*, agents which cause contraction and condensation of the tissues of the body.

The seventh division embraces but a single class, *expectorants*, agents which rectify wrongs of the respiratory apparatus.

The eighth division consists of those agents which counteract putrefaction, or the septic tendency, and are, in consequence of this action, termed *antiseptics.*

The ninth division embraces those agents which act specifically upon the uterus, and may be divided into three classes—*emmenagogues*, agents which promote the menstrual secretion; *parturients*, those which increase the expulsive efforts of the womb, and accelerate the process of parturition; and *abortives*, agents supposed to effect the dislodgement of the fetus in utero, producing abortion.

The tenth division embraces all agents that counteract spasmodic action, the single class being termed *antispasmodics.*

The eleventh division embraces but a single class, *anthelmintics*,—agents which destroy or cause the evacuation of worms.

The twelfth division embraces two classes that increase special secretions: *sialagogues*, those agents that increase the salivary secretion; and *errhines*, agents that increase the nasal secretion.

The thirteenth division embraces three classes, the action of which is chiefly chemical: they are *acids* and *antacids*, agents which regulate acidity; and *antilithics*, agents which counteract the tendency to the formation of calculous deposits.

The fourteenth division embraces three classes which act mechanically: they are *demulcents* and *emollients*, agents which soften and relax the tissues to which they are applied, and shield them from irritation; and *diluents*, agents which augment the fluidity of the blood and other animal fluids.

The fifteenth division embraces a single class of agents, called *antidotes*, agents capable of neutralizing or lessening the action of poisons.

The following table will exhibit this classification:—

1. Eliminatives,	Emetics,	Agents that evacuate the stomach.
	Cathartics,	Agents that evacuate the bowels.
	Diaphoretics,	Agents that increase the secretion of the skin.
	Diuretics,	Agents that increase the secretion of the kidneys.
2. Neurotics,	Sedatives,	Agents that lessen nervous sensibility.
	Narcotics,	Agents that produce sleep.
	Stimulants,	Agents that increase nervous energy.
	Anæsthetics,	Agents that produce insensibility.
3. Refrigerants,		Agents that diminish the heat of the body.
4. Hematics,	Tonics,	Agents that give tone to the system.
	Alteratives,	Agents that modify organic action.
5. Revulsives,		Agents that cure by producing a new point of irritation.
6. Astringents,		Agents that cause condensation of the tissues.
7. Expectorants,		Agents that increase and favor expectoration.
8. Antiseptics,		Agents that counteract putrefaction.
9. Uterina,	Emmenagogues	Agents that promote tbe menstrual secretion.
	Parturients,	Agents that excite contraction of the uterus.
	Abortives,	Agents that produce abortion.
10. Antispasmodics,		Agents that counteract spasms.
11. Anthelmintics,		Agents that remove worms.
12. Sialagogues,		Agents that increase the secretion of saliva.
Errhines,		Agents that increase the nasal secretion.
13. Chemica,	Antacids,	Agents that neutralize acidity.
	Antilithics,	Agents that prevent calculous formations.
14. Mechanica,	Demulcents,	Agents that shield the tissues.
	Emollients,	Agents that soften and relax them.
	Diluents,	Agents that increase the fluidity of the blood.
15. Antidotes,		Agents that counteract the action of poisons.

DIVISION I.

CLASS I.

EMETICS.

Emetics are a class of remedial agents which by producing a specific impression upon the sentient nerves of the stomach, or upon the nervous centers, are capable of exciting vomiting. Emetics may be divided into two classes, according to their mode of action: the first class prove emetic by their irritant effect upon the mucous membrane, and sentient extremities of the nerves of the stomach; the second, by being absorbed into the blood either affect the nerve centers, or by having a specific affinity for the mucous membrane of the stomach act there upon the terminal branches of the pneumogastric nerve.

Action of Emetics.—The action of both of these classes of emetics is similar in some respects; that is, in both the impression is transmitted to the pneumogastric nerve, or to the medulla oblongata, from which it arises; this excites the sensation of *nausea*, which is referred to the stomach. The reflex action is transmitted downward through the spinal cord to the muscles concerned in the process of evacuation, calling into action the muscles of the larynx, the diaphragm, and the abdominal muscles. The act of vomiting may be thus described: the patient first draws a quick, deep breath, the rima-glottidis is spasmodically closed to prevent the egress of the air, and thus prevent the diaphragm from being forced upward. The muscle of the stomach itself contracts, and the pylorus is at the same time forcibly closed; the abdominal muscles contracting press the stomach against the diaphragm, but being unable to act upon it, the stomach, which endures the pressure, is forcibly emptied of its contents.

The action of a *specific* emetic is not dependent upon the quantity, the nauseating taste, or the unpleasant smell of the article; some of the most energetic emetics will act very efficiently in minute doses, while the same article may have but little taste, and be entirely devoid of offensive odor.

A like result follows from injecting them into the veins, or into the rectum, and not unfrequently from their external application; showing most conclusively that emesis is induced by the specific influence which they exert upon the nervous centers.

Specific emetics always produce more or less nausea and relaxation of the system, whether their action is carried to emesis or not; while on the contrary, *irritant* emetics produce but little nausea, but merely a feeling of discomfort in the stomach.

The susceptibility to the influence of emetics is extremely variable in different persons, and a difference not unfrequently manifests itself in the same person at different times, depending upon the character of the disease, and a variation in the gastric sensibility of the patient. A dose that will scarcely affect one, may produce *hyper-emesis* in another, or in the same person at another time.

THERAPEUTIC INDICATIONS.

Emetics are employed in a diversity of diseases, and to fulfill a great variety of indications. They make a very powerful impression upon the system, and often effect important changes in the pathology of disease. Emetics are often valuable, and even very important agents when no specific disease exists, as well as in the opposite condition. When a train of morbid sensations, and an extensive chain of perverted sympathies exist, emetics are important agents in revolutionizing the whole system, and breaking up that concatenation of depraved sympathies.

We shall next proceed to notice, in detail, the various indications which emetics are capable of fulfilling, and their adaptation to the treatment of different diseases.

I. *Evacuation of the Stomach.*—They are valuable for the purpose of evacuating the stomach when that organ is overdistended with indigestible articles of food that oppress it, and thereby disturb the normal condition of the system. They are also useful when a redundancy of acid, or mucus is generated in the stomach. The nausea and vomiting which take place in such cases, pain in the stomach or head, or the "*sick-headache*," are often relieved by their use. When from an inverted peristaltic action of the duodenum, acrid, bilious matter is thrown into the stomach, when any vitiated accumulations take place in that organ, or when poisons, particularly those of the narcotic kind, are lodged in the stomach, emetics are pre-eminently useful for the purpose of ejecting the offending matter.

II. *Action in Febrile Diseases.*—Emetics are valuable therapeutic agents in the treatment of febrile diseases in general. During the early stages of many attacks of fever, the employment of emetics is of unquestionable importance. In the various forms of intermittents, and bilious remittents in particular, this class of agents may be administered with much advantage. They are also found useful during the early stages of typhus, typhus icterodes, continued, and synochal grades of fever.

1st. In the intermittent and bilious remittent fevers, and even in other types, when there are evidences of a morbid biliary secretion being thrown into the stomach by the inverted action of the duodenum, or in any case where there are vitiated materials accumulated in that organ, producing irritability, nausea, and a morbid sensibility, emetics are exceedingly valuable for the purpose of quieting that irritability, removing those vitiated materials, and for preparing the stomach for the reception and retention of other medicines, which would be rejected if it were not for this preparatory treatment. The removal of the vitiated secretions of the stomach, and such food as may be undigested, is of the first importance in all cases, for if not removed in this manner they are excreted by the bowels, and in their passage more or less is absorbed and conveyed into the circulation, thus vitiating the blood-fluid. They are not only of use in checking nausea and vomiting, which often prevent the use of the necessary remedies, but by their cleansing and exciting influence on the mucous membrane, they promote the ready absorption of agents which are administered after their action.

2d. By their mechanical action they compress the liver and abdominal viscera, they remove visceral congestions, overcome obstructions in the liver and portal circle, stimulate the chylopoietic viscera and glands of the intestines to action, give a powerful shock to the nervous system, and break up the morbid associations and diseased sympathies which often sustain and keep up the recurrence of the febrile paroxysms.

3d. The shock which they give to the nervous system is very frequently the means of arresting the disease, and restoring the patient to health, if resorted to before the system becomes prostrated, or the disease fully seated. They break the chain of pathological associations, substituting their own impression for that of the existing disease, and break up or counteract the periodic tendency.

4th. An emetic given a short time before the expected attack of the cold stage of ague, in order to have it in full operation at the time of the paroxysm, not unfrequently arrests it; and should it not, it renders it much milder—the cold stage is of shorter duration, and the reaction is comparatively feeble. They also prepare the system for the reception of tonics, whose remedial powers seem to be materially augmented by premising their administration with an emetic.

5th. They promote the secretion and remove congestion of the lungs, and thus aid in decarbonizing the blood; they also increase the renal, gastric, biliary and pancreatic secretions, and by their mechanical effects upon the abdominal viscera, and their influence over the hepatic secretions they often produce copious alvine evacuations. They thus prove depurative, removing from the blood the products of disintegration and chemical change, the presence of which is often as we have already seen a proximate cause of these diseases.

6th. By nauseating and relaxing the system, they most effectually overcome that spasmodic and constricted condition of the cutaneous exhalents which attends fever, and thus lessen the exalted action in the cutaneous capillaries, and consequently the abnormal generation of caloric which attends their increased activity.

7th. They act indirectly as sedatives, depressing the vascular and nervous excitement, thereby promoting diaphoresis. The cutaneous exhalation acts indirectly as a refrigerant, by the evaporation which takes place from the surface, in this way counteracting the abnormal generation of caloric.

These influences properly carried out, tend in a very powerful manner to lessen the intensity of the excitement, and to hasten the supervention of convalescence.

8th. By increasing the secretions in general, but particularly those of the lungs, liver, kidneys and skin, they act as depletives; and in this way supersede the necessity of resorting to the lancet. During the period of nausea and relaxation, they serve to depress the vascular and nervous action, and exert a sedative influence over the circulation; thus again, just as surely, and much more safely, fulfilling those indications for which the lancet is said to be alone adequate.

9th. They exert a revulsive influence, by making the stomach the center of an artificial fluxion, and thus detracting from the inflammation or congestion existing in some other organ. This influence is one of great importance in the treatment of all diseases, but particularly those of an inflammatory character; since by counteracting local congestions by virtue of their strong centrifugal influence over the circulation, they aid in a very powerful manner in equalizing the circulation and nervous excitement.

III. *Action in Diseases of the Respiratory Apparatus.*—Emetics are very important remedies in the various forms of pneumonia: in pleuritis, in pneumonia biliosa, in peripneumonia or in pneumonia proper, frequent gentle emetics will be found of great utility. Some have objected to the use of this class of remedial agents in the treatment of pneumonic inflammation, in consequence of the mechanical compression attending emesis. It has been asserted that they aggravate the sufferings of the patient and the intensity of the disease; but experience has fully convinced us that the objection urged against their use in this respect is not valid, especially when the mild vegetable agents to which we resort, are substituted for the poisonous minerals in common use in the old system of practice.

1st. In the most violent forms of pleuritic inflammation emetics administered in nauseating doses, for some time before full vomiting is desired, aided by copious draughts of warm diaphoretic infusions, will in a very short time produce a general relaxation, and a free perspiration; and when the system is thus brought under the influence of emetics, vomiting, instead of aggravating the sufferings of the patient, will generally give prompt and in many cases entire relief. The violence of the pain, and the respiratory suffering will be speedily mitigated, and will not be attended with a subsequent recurrence.

2d. In the various forms of pneumonia the smaller bronchial tubes and air-cells of the lungs will be found obstructed or loaded with a viscid tenacious mucus, unless the intensity of the inflammation has arrested the secretion. If it is arrested, emetics by their sedative influence upon the system, will diminish the inflammation and restore the secretion. If the secretion has not been arrested, and the bronchial tubes and air-cells are loaded with it, an emetic will be found exceedingly valuable in removing the obstruction.

They likewise exert many other salutary influences upon the system in the treatment of these diseases. They are important expectorants, they are valuable as diaphoretics and revulsives, they equalize the circulation, they act as depletives, they depress the vascular and nervous excitement, and exert a very powerful influence in subduing the inflammation.

They are equally applicable in the treatment of the various forms, and different stages of pneumonic inflammation, unless there is extreme prostration.

3d. Emetics are by no means an unimportant class of agents in the treatment of the various forms of cynanche, especially so in that form designated as croup. The speedy relief which they often afford in that disease is truly surprising. In cases where the patient is threatened with immediate suffocation, from the accumulated mucus in the larynx, trachea and bronchia, or from the pseudo-membranous formation which is the result of the inflammatory action in the larynx, an emetic will frequently give prompt relief. In order to secure the full advantages which this class of agents is capable of affording in this disease, it becomes necessary to repeat them frequently, and in some cases, much advantage will be gained by giving them so as to keep up a constant nausea and occasional vomiting for several hours.

4th. *Asthma* is another disease in which emetics are prominent remedies. They invariably give temporary relief, if taken during the asthmatic paroxysm; and if the patient is young, or the disease not too firmly seated in the constitution, an energetic and persevering course of emetics, assisted by suitable expectorants, together with auxiliary means both dietetic and medicinal, will do much toward effecting a radical cure. They are also valuable in *hooping-cough*, *nervous-cough*, *chronic bronchitis*, and the various *catarrhal* diseases occurring during the cold and variable seasons of the year.

IV. *Action in the Exanthemata.*—They are very useful in the exanthematous diseases, as measles, scarlatina and small-pox, especially in the early stages. When the pharynx and contiguous parts are ulcerated, inflamed, and swollen to such an extent as to impede respiration and deglutition, emetics will lessen the inflammation and swelling, cleanse the ulcers, remove the viscid secretions, establish a new action in the parts, equalize the circulation, act as diaphoretics; and if there is oppression of the lungs, which is frequently the case, especially in measles, they will remove it. They fulfill many other indications in these diseases. Thus, during the early stages of these complaints, if the eruption is tardy in making its appearance upon the surface, or when it has appeared, and a retrocession has taken place, emetics, by producing a determination to and relaxation of the skin, will bring it again to the surface.

V. *Action in Rheumatism.*—Emetics are occasionally employed in *gouty* and *rheumatic* affections with much advantage. When an arthritic habit obtains, a dyspeptic state of the stomach is generally present, in many cases a redundancy of acid being generated, in which event a course of mild emetics will do much toward arresting the paroxysms; and used in conjunction with proper restoratives, they will very materially aid in eradicating the arthritic habit. In inflammatory rheumatism, and even in the chronic form of this complaint, emetics, if given to keep up a constant nausea and diaphoresis, and to such an extent as to occasionally produce emesis, will recommend themselves as effective agents. They remove any morbid secretions from the stomach, subdue inflammatory action by their sedative and diaphoretic influence, and by acting as revellents, equalize the circulation.

VI. *Action in Hepatic Affections.*—In chronic hepatic affections, in torpor of the portal circle, in visceral obstructions, and in diseases of the glandular and lymphatic systems, emetics are useful in removing the torpor, and restoring the various organs implicated to a normal performance of their functions. The influence which they exert upon the sympathetic system of nerves, and the shock which they impart to the whole system in the act of vomiting, by the severe compression of the abdominal viscera, and by exciting a new action in the nervous, vascular and lymphatic systems, tends to prepare the patient for the reception of *tonics* and *alteratives*, when their influence will be doubly appreciable. In *jaundice*, experience decides in favor of their employment. If the biliary ducts are obstructed by calculi, producing jaundice, or if it arises from hepatic torpor, or functional derangement of that organ, emetics are valuable for removing the obstruction, by compressing the liver in the act of vomiting, and in arousing and restoring the healthy secretory functions of that organ.

VII. *Action in Dyspepsia.*—Gentle emetics are very useful in the treatment of *dyspepsia*, dependent upon debility or functional derangement of the stomach. Frequent mild emetics remove the morbid accumulation of acid and mucus from the stomach, and counteract the tendency to their generation; they remove the oppressed state of the stomach, induced by the presence of these morbid accumulations. In such conditions, the digestion is impaired, the gastric juice is vitiated, and its solvent properties weakened, chymification is imperfect, and the chyle is unhealthy. The intimate sympathetic relations existing between the digestive apparatus and the brain, are manifestly deranged by this unhealthy state of the stomach. Emetics are important for the purpose of counteracting this condition of the stomach, and the morbid sympathies which arise from it.

VIII. *Action in Hypochondriasis.* — Hypochondriasis is another disease in which emetics frequently prove beneficial. They often arouse the mental and physical energies of the hypochondriac, and dispel those gloomy forebodings which are essential characteristics of that disease; they also increase the susceptibilities of the system to other remedies. In this disease there generally exists a congestion of the portal circle, and a torpid and deranged state of the digestive organs, and a morbidly sensitive state of the brain and nervous system; in these conditions we have often witnessed the salutary influences of emetics.

IX. *Action in Mania.*—Emetics are also administered with much advantage in mania, arising from intemperance. In such cases the extreme insensibility of the stomach, sometimes requires that they should be administered in unusually large doses. In ordinary intoxication, they will evacuate the stomach, lessen the cerebral oppression, arouse the sensibilities of the nervous system, and restore the inebriate to a state of sobriety and consciousness more speedily than any of the ordinary remedies with which we are acquainted. If mania has arisen from the too free use of alcohol, an emetic not only evacuates the stomach, and thus removes the exciting cause, but it acts as a sedative, revellent, and an antispasmodic; it equalizes the nervous energy and excitement, and in many cases subverts the morbid habit.

X. *Action in Diseases of the Brain and Nervous System.*—In relation to their employment in *apoplexy*, a contrariety of views prevails. When apoplexy attacks a patient while the stomach is in a state of engorgement, the use of an emetic is of primary importance; but as a general rule their use is highly improper, and often dangerous. In this disease, as well as in all others in which the brain and nervous system are deeply involved, much larger doses will be required to accomplish the desired object.

Congestion, irritation and inflammation of the brain, or a morbid erythism of the nervous system, will require enlarged doses to secure their ordinary effects. The same is the case when there is a lack of the due oxygenation or aëration of the blood, as in *asthma*, *croup*, *bronchitis*, *asphyxia*, etc. The venous blood is oppressive to the brain, paralyzing the sensibilities of the nervous system, and thus deadens the susceptibility of the stomach to the influence of emetics. In such cases very powerful emetics are required, and their ordinary dose should be doubled or even quadrupled.

Emetics have also been used in *amaurosis*. If the stomach is disordered, they may be employed with a prospect of some advantage, but in most cases their use will not result in much benefit.

In *epilepsy* emetics are occasionally beneficial, although a contrariety of sentiment obtains relative to their utility in this disease. When the disease arises from a disturbed condition of the digestive organs, evidenced by nausea, flatulence, and other symptoms of indigestion, and in those forms of epilepsy assuming a periodic character, they frequently prove serviceable, and a persevering course of long duration has in some cases prevented a recurrence of the epileptic attack. They should be administered every third or fourth day, and in those forms which assume a regular periodicity a short time before the expected attack. Dr. Smith of New York asserts that they are more effectual in epilepsy and hysteria than any of the ordinary remedies used.

They are often used with great advantage in the different forms of *hysteria*. In the convulsive form of this disease, we have found them more speedy in arresting the convulsions than any other agents we have been in the habit of using. In those cases simulating syncope, emetics will arouse the patient and restore her sensibilities in most cases, as soon as they have produced nausea and full vomiting. In the chronic form of the disease, they are regarded by some of the most eminent physicians as being more effectual in removing the morbid state of the nervous system, upon which this disease is supposed to depend, than any other class of medicinal agents. The shock which they impart to the whole system, but particularly to the nerves, seems to prepare it for the reception of antispasmodics, tonics and alteratives, which agents are found doubly efficient where preceded by, or alternated with, an occasional emetic.

In *spasmodic* and *convulsive* affections they are preëminent. By nauseating and relaxing the system, they often exert a very powerful influence over the spasm; in these cases they are given not only by the mouth, but also used as enemata.

11. *Action in Amenorrhea.*—Wherever amenorrhea arises from a sudden check of the menstrual secretion, in persons of a plethoric habit, by exposure to cold, a spasm or constriction of the extreme uterine vessels is the result; when emetics, accompanied by warm diluents, pediluvia and fomentations, will in many instances speedily remove the constriction and restore the secretion. The nauseating, relaxing, sedative and diaphoretic influences in such cases are very desirable. In other cases, induced by any sudden mental excitement or emotion, or by any of the depressing or exciting passions, such as excessive anger, fear, joy or grief, causing a sudden abstraction of the vital and vascular afflux from the uterus and concentrating it upon the brain, or any other organ, they will not unfrequently be found valuable auxiliaries in equalizing the excitement, and restoring the catamenia.

In *chlorosis* arising from retention of the menses, when there is a languid circulation, with a depraved and variable appetite, emetics, in conjunction with chalybeates and tonics, will be found important in breaking up the chlorotic habit. In many cases it will be found that restorative agents will have but little if any effect, the digestive organs being so obstructed and weakened that those agents which are indispensable to the restoration of the normal quantity and quality of the blood can not be absorbed. In these cases we find more or less nausea, loss of appetite and loaded tongue. In such cases we have seen removed from the stomach by the action of an emetic, such quantities of offensive mucus and vitiated secretion, that we could not be surprised that our iron and tonics had proven ineffectual; in such cases as these the careful administration of an emetic is the first step toward a cure.

In *dysmenorrhea*, repeated emetics, the hip-bath and fomentations, aided by anodynes and antispasmodics, will prove of much advantage in subduing the morbid sensibility of the uterus and removing the spasm. We do not speak of their employment alone, because a combination of influences will be found more effectual than any one class simply.

XII. *Action in Dropsy.*—Emetics are frequently prescribed with great advantage in the various forms of dropsy, but particularly in *ascites* and *anasarca.* Their action promotes the activity of the absorbent system; vascular excitement retards absorption; emetics, therefore, by lessening vascular excitement, and producing depletion, favor this process, and prove of great utility in dropsical cases.

The full advantages of these agents can not be so effectually secured when the patient is permitted to drink freely of diluents during their operation. When given in this manner, the fluid furnishes the material for absorption; consequently the vessels are kept in a state of repletion, and the reabsorption of the exhaled fluid goes on slowly, if at all, and they fail to prove beneficial. When, however, a *dry emetic* is given—that is, an emetic with but a small quantity of fluid—it nauseates longer, proves more decidedly sedative, acts more effectually upon the lungs, kidneys, skin and intestinal exhalants, and thus more effectually depletes, at the same time that it facilitates the process of absorption. A very eminent writer relates a case in which a single emetic so effectually excited the mucous membrane of the stomach as to cause the patient to vomit six pints more than he drank during its operation.

They also act as revulsives, and while increased exhalation is taking place in the alimentary canal, and the other great emunctories of the system are active, the dropsical effusion must be lessened, and occasionally it has been entirely arrested, and a speedy cure has been the result. It is, doubtless, in these various ways that emetics increase the action of the absorbents, and effect the removal of the effused fluids.

XIII. *Action in Glandular Diseases.*—In diseases of the glandular system, such as enlargements of the glands, buboes, scrofulous tumors, hernia humoralis, etc., they not unfrequently disperse them with great rapidity, owing probably to their revolutionizing influence over the absorbent system. They may be used in many of the cachetic habits of body with much advantage. Mild emetics may precede or accompany the use of alteratives and general restoratives, in many of those depraved and vitiated states of the system characterized by cutaneous eruptions, and foul and ill-conditioned ulcers. The influence of alteratives and corroborants seems to be more decidedly sanative when they follow emetics, or when emetics are occasionally prescribed during the course of their administration, than when the important influences of this auxiliary class of agents are omitted.

XIV. *Action in Phthisis Pulmonalis.*—In the early stages of phthisis pulmonalis, gentle emetics are of great importance. They expel the mucus from the bronchial tubes and air-cells of the lungs, lessen the dyspnœa, and act very beneficially as expectorants. They lessen the irritation and congestion in the lungs, and equalize the circulation, diminish arterial excitement, and relieve laborious respiration; and in a short time, if early resorted to, will frequently effect a cure. In some cases we have administered them every morning, or every other morning, in nauseating doses, until they had relaxed the system, and then increased the dose until gentle emesis ensued; and this course, if persevered in for several weeks, aided by demulcent expectorants, and such agents as will improve the quality and quantity of the blood, will be followed by the happiest results. It checks the cough, allays the irritation of the lungs, mitigates the urgent symptoms, and is often of itself attended with an increase of strength. An occasional emetic, throughout the whole course of the disease (if there is not too much debility), will give great temporary relief; in the advanced stages of the disease they are too debilitating, and should rarely be prescribed.

XV. *Action in Diabetes.*—Emetics are found to be very useful in diabetes. In several cases in which we have used them, they seemed to exert a very happy influence. Others speak very favorably of their use, and cases are recorded in which a single emetic has effectually arrested the disease. They equalize the circulation, stimulate the digestive apparatus, promote the secretions of other organs, and probably in this way lessen the burden imposed upon the kidneys, giving them time to recover their tone.

XVI. *Action in Ophthalmia.*—Ophthalmia is another disease in which emetics are found to exert an important influence. Much authority might be adduced in favor of their administration in this affection, when there is a deranged condition of the digestive organs, and acidity of the stomach; which is by no means an unfrequent occurrence, both in the acute and chronic form of the disease. In acute ophthalmia, their depletive, revulsive and sedative influence over the disease is very conspicuous.

XVII. *Action in Dysentery.*—In dysentery they are often resorted to with great advantage. This disease is often connected with, or dependent upon a redundancy of vitiated bile, or other irritating materials accumulated in the primæ viæ. When this is the case, emetics are indispensable; their tendency to equalize the circulation and promote diaphoresis, renders them especially valuable.

XVIII. *Action in Hemorrhage.*—Emetics are occasionally employed in the various forms of hemorrhage. With regard to their use in *hemoptysis*, some discrepancy of opinion exists. When administered in nauseating doses, for some time before emesis is effected, they diminish the momentum of the circulation by their sedative influence, relax the system, and equalize the circulation; and may be occasionally prescribed with safety and advantage. But as a general rule, we conceive that their mechanical influence would be hazardous; the impetus which they give to the pulmonary circulation renders their indiscriminate employment objectionable, and in many cases dangerous. In active hemorrhages they should be used with much caution. If administered in small doses and not often repeated, their equalizing, revulsive and sedative influences counteract any bad effect that might otherwise occur. In passive hemorrhages from the lungs, and in those witnessed in the incipient stages of phthisis pulmonalis, mild emetics are valuable auxiliaries to expectorants and other pectoral agents.

The same objection does not rest against their use in *uterine hemorrhages;* an equal amount of mechanical force is not exerted upon the uterine vessels in emesis; neither, in like cases, is the same impediment presented to interrupt the uterine circulation, as is the case in hemoptysis. Emetics cause contraction of the uterus, and thus the orifices of the bleeding vessels are closed, and many cases are reported in which they have proved efficacious.

Hæmatemesis is often owing to visceral engorgement, or torpidity of some of the abdominal viscera, producing irregular congestions, and hemorrhages. Emetics remove the venous congestions, and by the pressure which they cause to be exerted upon the diseased viscus, the exhaling vessels are compressed, and the hemorrhage is arrested.

SPECIFIC INDICATIONS FOR THEIR USE.

The tongue is broad, full, dirty, and especially coated at its base. There is sometimes nausea, disgust for food and drink, and everything taken seems to stop at the stomach. The patient complains of sensations of weight and oppression at the epigastrium.

CONDITIONS CONTRAINDICATING THEIR USE.

1. They are contraindicated in apoplexy, phrenitis, cerebral congestions, in short in all cases where a great determination to the brain exists.

2. They are improper in advanced stages of pregnancy, in hernia, aneurisms of any of the large vessels, hypertrophy of the heart, or ossification of the arteries or valves of the heart; we might say in any disease of the circulatory system.

3. They are improper in all cases of extreme debility, as in the more advanced stages of febrile and inflammatory disease, etc.

4. In *gastro-intestinal* irritation or inflammation, their ordinary use is very improper.

As a general rule emetics are inadmissible in the above cases, but we can lay down no infallible rule for their employment, as circumstances may occur in such relations to the usual contraindications, as to justify their use.

In febrile affections, where there is great excitement, if no danger would result from a delay, emetics should not be administered until the fever abates. If they are prescribed during the exacerbation they do not operate so kindly and effectually as they do during the declination or stage of apyrexia. Not only so, but largely increased doses are required to produce the same effect. During the hight of the fever, every fiber is tense, and the exalted erythism of the nervous and vascular systems lessens the susceptibility to their influence. They should be administered, at first, during the pyrexial stage, in nauseating doses, to relax the system; and this influence should be aided by warm infusions of eupatorium, or chamomile; when there is sufficient relaxation, and perspiration is induced, the dose may be increased, and repeated every twenty or thirty minutes, until the stomach is thoroughly evacuated, and the whole system is brought under their influence.

Another rule pertaining to the administration of emetics (and one not to be rejected as unimportant), is the avoidance of cold drinks during their operation. It is improper for them to be given even when the mildest emetics are prescribed, but especially so during the use of tartrate of antimony. When the stomach is relaxed by the emetic, and large quantities of warm fluids, cold drinks often produce violent (and in some cases fatal) spasms of that organ. The shock is powerful, and its effects not unfrequently irremediable, even when the most potent stimulants and antispasmodics are speedily used. Dr. Eberle notices two cases of sudden death caused by drinking cold water, soon after taking a dose of *tartar emetic.*

Another rule, never to be violated, is the use of simple, digestible and unirritating diet for twenty-four hours after an emetic. Emetics produce a temporary relaxation of the muscular fiber of the stomach, and lessen its digestive powers; hence the necessity for time to enable it to recover from this enervation, before being taxed with the elaboration of even a small portion of most of the ordinary indigestible articles of diet in daily use.

RECAPITULATION.

1st. Emetics serve to expel any morbid or vitiated matter, whether undigested food, secretion, or poison from the stomach.

2d. They serve to promote general relaxation, equalize and lessen the momentum of the circulation, counteract congestion, excite the liver and other glands to action, promote diaphoresis, and act as depletives, deobstruents, and eliminatives.

3d. The shock which they impart to the nervous system is often productive of much good in the early stages of fever, and likewise in many chronic diseases, arresting the disordered action by supersession.

4th. Emetics are often productive of much good in spasmodic or convulsive action, being by virtue of their action on the brain and nervous system, powerfully antispasmodic.

5th. In many chronic affections of the chylopoiëtic viscera, and glandular system, they prove beneficial by newly exciting those organs, promoting absorption and the various secretions and excretions—thereby subverting morbid action.

6th. They promote the bronchial secretion, and facilitate expectoration, and therefore are of great importance in diseases of the respiratory organs, such as croup, asthma, pertussis, bronchitis, pneumonia, etc.

7th. From their supersedent, sedative, depletive, revulsive, relaxing, deobstruent, depurative and equalizing effects, they often exert a revolutionizing influence upon the entire system, thereby breaking up perverted associations, and in many instances completely subverting existing morbid sympathies, and effecting permanent cures.

In these various ways they serve as valuable auxiliaries to the use of tonics, alteratives, etc., co-operating with, and materially facilitating their curative action.

ANTI-EMETICS.

Following the consideration of remedies which produce emesis, we will briefly study the remedies and means which check nausea and vomiting. In some cases these remedies act upon and through the nervous system, being sedative in one case, stimulant in another. In other cases the action is topical upon the mucous membrane of the stomach. In others it is chemical, comprising acids, alkalies, and antiseptics. In still others the action is upon a different part, with which the stomach is in sympathy. The nausea and vomiting being sympathetic, it is relieved when the original disease is removed.

IPECACUANHA.

THE ROOT OF CEPHAELIS IPECACUANHA.—BRAZIL.

PREPARATIONS.—Powder, Tincture, Syrup, Emetina, or Emetia.

DOSE.—The dose of the powder will be from grs. x. to grs. xxx , every ten or fifteen minutes with warm water, or some warm stimulant infusion ; of the tincture gtt. x. to ℨss., every ten minutes with warm water or a warm infusion. Emetia is rarely used by hypodermic injection, the dose being one to two grains.

THERAPEUTIC ACTION.— Ipecacuanha is emetic, diaphoretic, expectorant, laxative and alterative. In full doses it is one of the mildest and most valuable emetics known. If it does not produce emesis, it generally soon proves cathartic. If administered in smaller doses, it acts as a stimulant, diaphoretic, expectorant, or laxative ; and in still smaller doses, as a tonic and alterative. Its first effect upon the system, when administered, is that of a stimulant, or irritant to the mucous membrane of the stomach, and not until its active properties have been absorbed, does it cause nausea, depression, and vomiting. Hence it belongs to the class of *specific emetics*,—those which produce emesis when introduced into the circulation from any part of the system.

As an emetic the ipecacuanha does not depress the system like many other of the vegetable emetics. It may, therefore, be resorted to in cases of debility, when other agents would be inadmissible. As a mild, effectual agent it may be prescribed whenever there is a foul state of the stomach, arising from a redundancy of mucus, or of the biliary secretion, or retained indigestible aliment. Its mildness and efficiency recommend it, when the object is simply to evacuate the stomach, or when a gentle influence of this kind only is desirable. Its gentle action also renders it a very popular and highly valuable emetic, in numerous diseases of children.

It is used in minute doses as an alterative, either alone or combined with other agents, as sulphur, cream of tartar, guiacum, sarsaparilla podophyllin, sanguinaria, taraxacum, etc. In hepatic torpor, and where there was obvious derangement of the chylopoietic system, we have often combined it with the extract of taraxacum, podophyllum, and sanguinaria, forming the mass into pills, which have proved highly beneficial.

In small doses it often proves valuable as a stimulant, tonic, and alterative, in dyspepsia, and other diseases, combining it with some of the bitter tonics, the action of which it facilitates.

It is sometimes combined with cathartics; two or three grains of it greatly facilitate the action of these agents, and even render small doses more efficient than large ones, when given uncombined.

As an expectorant and diaphoretic it is often combined with the more stimulating agents, as the squill, senega, etc.

SPECIFIC INDICATIONS.—Irritation of bronchial mucous membrane and air-cells; irritation of stomach; irritation of small and large intestines.

SPECIFIC USES.—In acute bronchitis and pneumonia; in nausea, vomiting, and irritative dyspepsia; in cholera infantum, diarrhœa, dysentery, menorrhagia, and hemoptysis.

In bronchitis, and especially in pneumonia, Ipecac in small doses takes a first place. As the pulse is frequent and the temperature increased, it is usually combined with Aconite.

In irritation of the stomach, especially if the pulse is frequent, and the temperature is increased, Ipecac is the remedy.

In cholera infantum, Ipecac is suggested as a principal remedy. With frequent pulse and increased temperature of the abdomen, it is given with Aconite. With pallid or yellowish face, abdominal pain, pallid tongue, nausea and vomiting, it is associated with Nux.

In the ordinary diarrhœa of irritation Ipecac is a very certain remedy. Give it with Aconite or Nux, as may be indicated.

In the common form of dysentery—colitis, or simple inflammation of the large intestine—Ipecac is as near a specific as we can imagine. In zymotic dysentery it may form a part of the treatment, but anti-zymotics will take precedence.

DOSE.—For these uses the dose will be small—Tinct. Ipecac gtt. v. to gtt. xv., water ℥iv.; a teaspoonful every hour.

LOBELIA.

THE ENTIRE PLANT, THE SEEDS, OF LOBELIA INFLATA.—U. S.

PREPARATIONS.—The powdered seeds, the powdered plant, the tincture, the acetous emetic tincture, the oil.

DOSE.—The dose of the powdered seed will be from grs. x. to grs. xx. every fifteen minutes; of the powdered plant, ʒss. to ʒj.; of the tincture gtt. x. to gtt. xx. every ten minutes; of the acetous tincture ʒss. to ʒj. every ten minutes. The oil is not used as an emetic. The acetous emetic tincture (Lobelia, Sanguinaria, Ictodes, *aa.*) is a very good preparation, and may be used in doses of one teaspoonful every ten minutes to free emesis. The emetic powder (Lobelia, Sanguinaria, Ipecacuanha, Ictodes, *aa*, Capsicum one-eighth part) is employed in infusion when stimulation is thought necessary.

THERAPEUTIC ACTION.— Lobelia is emetic, expectorant, diaphoretic, antispasmodic, sedative, and sometimes cathartic. It acts in a manner similar to tobacco, though it is much milder, and is generally regarded, when given in large doses, as an acro-narcotic poison.

When the herb is chewed incautiously, it occasions a sensation of burning and distension, which extends down the œsophagus, and finally nausea and vomiting follow, attended with giddiness, tremors, and headache, with excessive prostration. In some instances purging occurs as well as emesis, with copious perspiration and general relaxation. If the dose is too large and frequently repeated, it usually produces general prostration and relaxation, accompanied with profuse perspiration. Extreme nausea, great anxiety and distress, are the two frequent concomitants of its administration; nevertheless, the usually short duration of these symptoms, and the salutary impressions which it makes upon the system, compensate, in most instances, for any transient deleterious effect which it may produce. If it acts promptly as an emetic, the unpleasant effects named are much less liable to be manifested.

Lobelia is a prompt, safe, and efficient emetic, equaled by few, and surpassed by none, when resorted to for this purpose. It operates promptly and very thoroughly, but its action is less protracted, and less apt to produce such compression of the liver as will cause copious bilious evacuations than other agents often used. As an emetic it may be resorted to in all cases where a gentle, yet efficient agent may be demanded.

As a general rule, during the forming or early stages of many febrile affections, the use of this article will be found highly valuable. It produces nausea, great relaxation, and diaphoresis; it also exerts a powerful sedative influence upon the nervous system, lessening the force and frequency of the heart's action. Its harsh and irritant properties may be greatly modified by combining with it other emetic agents, and still its valuable sanitary powers upon the system retained.

It proves equally important in the treatment of many acute inflammatory affections, especially in those of the respiratory organs. In all the forms of pneumonia, pleuro-pneumonia, and pleurisy, it occupies a conspicuous place among our therapeutic agents. As a nauseating emetic, antispasmodic, efficient expectorant, and diaphoretic, and secondarily as a sedative, it stands unrivaled. In the most aggravated forms of these complaints, if this article is administered in small and nauseating doses in conjunction with the free use of diaphoretic infusions, with a view to relax the system most perfectly before emesis occurs, it almost uniformly affords relief; it should be frequently repeated if the debility is not so great as to forbid it. It speedily relieves the dyspnœa, pain and oppression in the chest, and proves highly expectorant and antiphlogistic, for the reasons already assigned.

In asthma and pertussis it is one of the most important remedial agents which we can employ. In relation to the latter disease, Dr. Eberle observes, that he has used it combined with the extract of Belladonna (gr. v. to ℥j. of the infusion of Lobelia; dose, gtt. xx. to ʒj., according to age, three or four times daily), with unequivocal advantage. When administered in asthma, it almost invariably gives prompt relief, and no physician who has once used it, will fail to resort to it again whenever occasion requires.

In the various forms of cynanche, especially in cynanche trachealis, it is a very important agent. It is rarely administered in croup without giving prompt and, in many cases, permanent relief. In those forms of cynanche in which there is ulceration of the fauces, or tonsils, rendering deglutition difficult, it often mitigates the urgent symptoms and facilitates convalescence.

In dyspepsia its stimulant properties, and the strong impression which it exerts upon the chylopoietic viscera, render it superior to many others, perhaps we might say to all other agents of this class.

In protracted *nausea* and *vomiting,* when other agents had failed to arrest it, lobelia administered in minute doses, has proved effectual in quieting the stomach.

It is exceedingly important in many chronic affections, when the object is to give the nervous system a very powerful shock. Its acro-narcotic properties in such cases, and its well-known influence upon the nervous system, render it an important auxiliary to the use of tonic and alterative medicines.

In chronic bronchial affections and in phthisis, lobelia has been administered every morning, or second or third morning, with great apparent advantage; indeed, many cases are said to have been cured by it alone There can be no question as to its salutary influence in such cases, when administered in small doses so as to keep up a continued nausea for some time before emesis occurs. Its stimulant, expectorant, and relaxing influence upon the respiratory organs, removes the accumulated mucus, lessens the cough, and instead of debilitating, often exerts an invigorating influence upon the patient.

As a stimulating expectorant it may be used in pulmonary affections, both of an acute and chronic character, either alone or combined with less exciting agents, as the ipecacuanha, asclepias, Indian turnip, ictodes, etc., etc. It is very valuable in chronic catarrhal affections, coughs, colds, and irritation of the respiratory organs.

In spasmodic or convulsive diseases the lobelia is of unquestionable importance. In hysterical convulsions, in tetanus, and, in short, in any of the convulsive diseases, we are in possession of no article which more effectually controls spasm than this. In hysteria of a chronic character, the strong impression which it makes upon the nervous system renders it more effectual in breaking up that morbid habit, or condition of the nervous system, than any other agent belonging to the class of emetics, and perhaps we might say, to the list of remedial agents.

In violent spasmodic colic it is very efficient in giving relief. It may be used in the form of enemata in spasmodic and convulsive diseases, in colic, hysteria and tetanus, in cases of strangulated hernia, etc. When used as an injection, or when applied to the surface, it often produces its specific effects, as nausea, vomiting, sedation, and general relaxation of the whole system. Lobelia is often used as an external application, in the form of a discutient cataplasm, as a fomentation, and as an embrocation. It may be combined with other agents of a discutient and narcotic character, and together with the ulmus fulva made into a cataplasm, and applied to indolent and painful tumors. It has been used as a fomentation, and as an ointment in cases of contracted tendons, stiff joints, etc. The tincture has been applied to the surface in herpetic affections of different kinds, and in cases of poisoning from the Rhus radicans or poison vine, and also in cases of chronic ophthalmia, with some benefit.

The diseased conditions in which this agent may be used with advantage, are numerous; and we do not wish to detract from the importance and superior merits of the article when we say we believe it has occasionally done irreparable injury, and in some instances been destructive of life; and that the too profuse and indiscriminate use of it by one class of physicians, is only equaled by the obstinate refusal to test its virtues, and unwarrantable objections urged against it by others.

Specific Indications.—The pulse is full and oppressed, or small and feeble. Oppression in the præcordium, labored action of the heart, and cardiac pain. Oppression of the chest, difficult and labored respiration, accumulations of mucus in bronchiæ. Rigidity of os uteri, with thickness of tissue.

Specific Uses.—In all cases where the pulse is full and oppressed, or small and oppressed, the Lobelia may be employed with advantage. It is specific in most cases of angina pectoris, and in neuralgia of the heart. It is an important remedy when the patient complains of oppression in the chest and difficult respiration It is specific in the asthenic laryngitis of children, and in analogous cases of the adult. It is also an important remedy when there is profuse secretion and want of power to remove it. It stands first in the materia medica as a remedy in difficult labor from rigidity of the os and perineum, (carried to slight nausea). In conclusion, it may be regarded as one of the most direct stimulants to the sympathetic nervous system, and it influences every organ and function supplied or controlled by these nerves.

DOSE.—For ordinary use, tincture of the seed gtt. v. to gtt. xx. in water ℥iv.; a teaspoonful as often as required. In angina or neuralgia of the heart, a single dose of gtt. x. to gtt. xxx., which may be repeated if necessary. In asthenic bronchitis we sometimes combine it with a simple stimulant, as Comp. Spirits of Lavender.

GILLENIA.

BARK OF THE ROOT OF GILLENIA TRIFOLIATA.—U. S.

PREPARATIONS.— The powdered bark, a tincture of the recent root-bark.

DOSE.—As an emetic, from grs. x. to grs. xxx, repeated every fifteen minutes; as a cathartic, grs. v. to xv. The tincture may be employed as an emetic in doses of half a teaspoonful; as a laxative in doses of gtt. x. For the relief of irritation of mucous membranes, whether of digestive or respiratory apparatus, gtt. x. to xx. in water ℥iv.; a teaspoonful every one or two hours.

THERAPEUTIC ACTION.—Gillenia is emetic, cathartic, diaphoretic, expectorant, and tonic. It is a mild and efficient emetic, and may be prescribed wherever a gentle agent of this kind is demanded. As an emetic, diaphoretic, expectorant and tonic, it may be used as a substitute for Ipecacuanha, which agent it closely resembles in its therapeutic action. In some sections of country it has nearly superseded the use of this article.

In intermittent and bilious remittent fevers, in inflammatory diseases of the respiratory organs, in rheumatism, dysentery, etc., it may be employed, first, with a view to its emetic influence; secondly, as a diaphoretic and aperient. In dysentery, Dr. Eberle speaks very highly of it in small doses, in combination with opium, as a sudorific. It may also be used with nitrate of potash and opium, as a diaphoretic in fevers.

APOCYNUM.

THE ROOT OF THE APOCYNUM CANABINUM.—U. S.

PREPARATIONS.—Whilst the powder or a decoction might be employed, we recommend a tincture for all the uses of this remedy.

DOSE.—Of the powder as an emetic, grs. xx. to grs. xxx., repeated; as an hydrgogue cathartic, grs. x. to grs. xv. Of the tincture gtt. xx. to gtt. xxx., with a stimulant infusion, as an emetic; as a cathartic, gtt. x. to drops xv. For its specific use gtt. x. to gtt. xv., to water ℥iv., a teaspoonful every one to three hours.

THERAPEUTIC ACTION.—The Apocynum is an emetic, cathartic, expectorant, diaphoretic, diuretic, alterative, tonic, and errhine. In full doses it causes nausea, with a reduction of the frequency of the pulse, and a tendency to sleep, vomiting, etc., succeeded by large watery discharges from the bowels with general perspiration.

The medical properties of the Apocynum are various and important. In suitable doses it is a mild, safe and tolerably active emetic. It produces more or less drowsiness, and a reduction of the pulse, which seems not to depend wholly upon the exhaustion which follows from vomiting.

Although this agent is emetic, yet it is not very often used for this purpose, being more frequently employed as an aperient and hydragogue cathartic, diuretic, and in small doses as a tonic. It is not unfrequently prescribed by physicians in the country as a substitute for the ipecacuanha. It may be used in the early stages of intermittent and remittent fevers, as well as in many other cases in which emesis is indicated.

If administered in doses not sufficiently large to cause vomiting, and repeated every two or four hours, it acts as an efficient *hydragogue cathartic.* It is by no means an unimportant agent in dropsy; we have used it in many cases of hydrocephalus with unequivocal advantage, and in hydrothorax and ascites, much benefit may be expected from its employment. As a hydragogue cathartic, diuretic, diaphoretic, and tonic it seems to give promise of becoming a highly valuable therapeutic agent in this class of diseases; indeed there are those who regard it almost as a specific. When combined with the bitartrate of potassa and the spearmint, its efficacy is increased. In this form it should be given so as to keep up frequent purging, for several days in succession. Its tonic properties counteract to a great extent the debility which might otherwise arise where used so profusely. At the same time that it stimulates the intestinal exhalants, it promotes active diuresis and absorption.

Specific Indications.—The tissues are full, as if infiltrated with water—œdema. Uterine hemorrhage, with full, relaxed uterus. Hemorrhage from the lungs, with sense of fullness and oppression.

Specific Uses.—It may be used in any disease having the characteristic symptom—watery fullness of tissue, œdema. It is especially the remedy in many cases of dropsy, removing the fluid and curing the diseased condition upon which the dropsical effusion depended. It is a prominent remedy in rheumatism presenting this symptom. In uterine hemorrhage with œdema of feet, or in hemorrhage of the lungs with same symptom, I should not think of another remedy.

SANGUINARIA.

THE ROOT OF THE SANGUINARIA CANADENSIS.—U. S.

Preparations.—The powdered root, syrup, a tincture, an acetous tincture, nitrate of sanguinaria.

Dose.—The dose of the powder as an emetic, grs. x. to grs. xx.; of the acetous tincture as an emetic, ʒss. to ʒj. For the other uses, the tincture may be employed in doses of from the fraction of a drop to gtt. x. For its specific use, I prefer the nitrate of sanguinaria, grs. j. to water ℥iv.; dose a teaspoonful.

Therapeutic Action.—Sanguinaria is emetic, expectorant, diaphoretic, acro-narcotic, sedative, alterative, and in small doses tonic and stimulant. Administered in full doses it induces nausea and vomiting, with a sensation of warmth in the stomach, acceleration of the pulse, and slight headache. It acts on the fauces, producing an acrid impression, and in some cases it proves cathartic. The leaves and seed possess similar properties; the seeds, however, are said to exert a marked influence upon the brain and nervous system, occasioning torpor, languor, disordered vision, and dilatation of the pupils. In large doses the emesis is violent; there is a burning sensation in the stomach, faintness, vertigo, dimness of vision, and alarming prostration.

This article is one of much importance, owing to the diversity of properties possessed by it, and the varied indications which it fulfills, according to the dose and mode of administration. In large doses it is an acrid emetic; it is active and thorough in its operation, and not unfrequently produces a violent burning pain in the stomach, thirst, vertigo, prostration, and other symptoms common to the free use of acronarcotics. In small doses it is a stimulant tonic, and a stimulating expectorant. When first administered it acts as an excitant, and, if the dose is sufficiently large, its secondary effects are those of sedation.

As an emetic it is not often used, except in combination with less acrid agents. If combined with the lobelia and ictodes, it makes a valuable addition to those agents, and may be thus used in all febrile and inflammatory affections in which prompt and thorough emesis is indicated. We have used this combination extensively, for many years, in the treatment of intermittent and bilious fevers, and also in diseases of the respiratory organs; and this long experience has resulted in the conviction that, for the purpose of cleansing the stomach, arousing the liver and glandular system in general, restoring the secretions, and lessening exalted organic action, we have no combination that exceeds it in value. While it is efficient in its action, it is much less debilitating than the ipecacuanha, or tartarized antimony, so frequently used.

As an *independent* emetic, it is mostly resorted to in diseases of the respiratory organs, as in phthisis pulmonalis, asthma, pertussis, laryngitis, catarrhal affections, etc. In all diseases of this kind, when an emetic is indicated, this article may be employed with a prospect of advantage.

As a *stimulating expectorant*, it may be employed in typhoid pneumonia with much advantage; we frequently combine it with the asclepias tuberosa, in this disease. In the various diseases of the respiratory passages and organs, after the acute inflammation has been moderated by the use of emetics, cathartics, diaphoretics and revulsives, this article is of unquestionable importance. If administered early as an expectorant, before the high grade of inflammatory action has been moderated, it often proves too exciting, unless conjoined with less stimulating agents, anodynes, and demulcents. We likewise believe this article to be one of superior efficacy as a pectoral in the treatment of phthisis pulmonalis; it acts as a sedative to the respiratory organs, allays irritation, promotes expectoration, stimulates and sustains the system, and acts as an alterative. It may be used in the form of a powder, or tincture, but the syrup is preferable in this disease. It has proved valuable in hemoptysis, probably by its sedative influence upon the circulation. In croup, asthma and pertussis, many who have become acquainted with its merits, place it at the head of curative agents in the treatment of these diseases.

Specific Indications.—Sensations of burning and itching of mucous membranes, especially of fauces, pharynx, eustachian tubes and ears; less frequently of larynx, trachea and bronchia, occasionally of stomach and rectum, rarely of vagina and urethra. The mucous membrane looks red and irritable. Sometimes the redness will be of the end of the nose.

Specific Uses.—The uses of the remedy will be obtained by the indications as above. I have used it in chronic disease of the ears and eyes, pharyngitis, laryngitis and bronchitis, irritative dyspepsia, uterine and vaginal disease, and in the chronic exanthemata.

EUPHORBIA.

BARK OF THE ROOT OF EUPHORBIA CORROLATA.—U. S.

Preparations.—The powdered bark. A tincture.

Dose.—As an emetic, grs. xv. to grs. xxx., every fifteen minutes. Of the tincture for an emetic, one-fourth to one teaspoonful every fifteen minutes. For other uses the tincture is employed in doses of a fraction of a drop to ten drops.

Therapeutic Action.—Euphorbia is emetic, cathartic, expectorant, diaphoretic, and deobstruent. The Euphorbia corrolata, when given in large doses, is a very powerful emetic; in smaller doses it acts as a hydragogue cathartic; and in small doses, as a diaphoretic and expectorant. Drs. Eberle and Beach also attribute tonic properties to it. The violence of its action in large doses, admonishes the physician of the danger attending its indiscriminate and too free use, for if used thus it may produce hyper-emesis, or hyper-catharsis, and a dangerous inflammation of the gastro-intestinal mucous membrane. Some authors assert that, when administered in large doses, it is scarcely equaled for certainty of action by the tartar emetic. If administered in doses not sufficiently large to readily produce emesis, it produces catharsis, attended with great nausea and extreme prostration.

As an emetic, it may be employed whenever a very efficient article of the kind is required, providing there is no tendency to gastro-intestinal inflammation, nor a state of debility to contra-indicate its use.

It has been employed with decided advantage in cases of dropsy. When administered as an emetic, it very powerfully affects the organs of secretion and excretion, and also acts as an energetic hydragogue cathartic, directly lessening the dropsical effusion, and at the same time promotes absorption. It may be employed in all the different varieties of dropsy, and has been the principal agent relied on in the cure of some protracted and obstinate cases of hydrothorax. In hydropic cases, it should be administered every second or third day as an emetic, if the strength of the patient will permit, and continuing it between times, in smaller doses, as a hydragogue cathartic, assisted with corroborant medicines and suitable diuretics.

It has been prescribed with advantage in amenorrhœa, and there are those who speak very favorably of its effects in uterine obstructions.

The Euphorbia ipecacuanha is more frequently used than the corrolata; it is analagous in its action to that variety, but is less energetic. Dr. Barton thinks its properties entitle it to supersede the imported ipecacuanha. It operates as an emetic very mildly, yet energetically, if administered in suitable doses. In over-doses it may cause hyperemesis, hypercatharsis, and great prostration. In doses of twenty-five grains, Dr. Barton has known it produce hypercatharsis and continue to operate fourteen hours. Dr. Beach speaks very highly of its salutary effects in dropsy, and mentions its reputation as an "infallible" cure for bilious colic. As an emetic it may be employed in intermittent and bilious fevers, and in diseases of the respiratory organs. It is valuable as a diaphoretic and expectorant, and is not so unpleasant as the ipecacuanha, the taste being less nauseous.

Specific Indications.—Persistent irritation of the stomach, irritative diarrhœa, dysentery, dropsy with irritation of mucous membranes. Of the tincture gtt. v. to gtt. x., water ℥iv.; a teaspoonful every one or two hours.

EUPHORBIA HYPERICIFOLIA.

Preparation.—A tincture from the fresh plant.

Dose.—Tincture of Euphorbia gtt. x. to gtt. xxx., water ℥iv.; a teaspoonful every hour or two hours.

Specific Indications.—Irritation of the stomach, diarrhœa, dysentery, with evidences of irritation of mucous membranes.

Specific Uses.—This remedy has been largely employed in the treatment of cholera infantum, taking the place of ipecac, but in other years it has had a better influence than ipecac. In some seasons and in some cases in other years it has not been so good. We have also employed it in the diarrhœa of adults, and in sporadic dysentery. I think it will meet the indications in some zymotic dysenteries, but it wants proving in these. It will also be found to take the place of ipecac in some cases of bronchitis and pneumonia.

VERBENA.

ROOT OF THE VERBENA HASTATA.—U. S.

Preparations.—For an emetic, a decoction of ℥ij. to water Oj., has been employed, giving one-fourth the quantity every fifteen minutes. For other uses a tincture is preferable.

Dose.—The dose of the tincture will vary from the fraction of a drop to half a drachm.

Therapeutic Action.—Verbena is emetic, diaphoretic, expectorant and tonic. As an emetic, it may be used in the form of a strong decoction, in doses of one ounce every ten minutes, until it vomits effectually. It forms a very efficient emetic, and may be prescribed with advantage in "sick-headache," arising from indigestion, or debility of the stomach, in fevers, and whenever a mild emetic is indicated. It may also be used, with a prospect of success during the forming stages of fevers, but particularly in intermittents a short time before the paroxysm; in this case it should be given to the extent of producing full vomiting and perspiration. If administered in small and frequent doses, in the form of a cold infusion, during the intermission, it acts as a tonic and antiperiodic, and not unfrequently effects a permanent cure.

As a diaphoretic and expectorant, it is very beneficial in colds, coughs, and diseases of the respiratory organs. It is even said by some, though the authority is questioned, to have cured many cases of consumption. Scrofula is another disease in which it is said to have proved highly useful; it is also prescribed in obstructions of the glandular system, arising from cold. It is also highly recommended in amenorrhœa, and obstructed or suppressed lochia. In the former complaint, the tincture, decoction, or extract may be used. The extract when combined with the sulphate of iron and gum myrrh, constitutes a very good emmenagogue pill. The extract and sugar have been melted together, and used as a lozenge in the same cases. We have found a warm infusion a very superior agent in suppressed lochia. Some recommend it as anthelmintic, and others speak favorably of it in calculous and nephritic affections. The cold infusion, in small doses, promotes the appetite and favors digestion.

Dose.—As an emetic, the dose of a decoction of ℥ij. to Oj. of water, is from ℥iv. to ℥vj. every ten minutes. As a tonic, the cold decoction may be given in doses of ℥j., and repeated as often as may be desired. As a diaphoretic, the warm infusion may be given in doses of ℥iv., every hour.

The Verbena urticifolia, the white or nettle-leaved vervain, is sometimes employed, but is a very inferior substitute for the preceding species. Schœpf states that it has been used in poisoning from the Rhus toxicodendron; boil it in milk and water with the inner bark of the white oak and apply.

PORCELIA.

THE SEEDS OF PORCELIA TRILOBA.—U. S.

Dose.—As an emetic, from gtt. x. to ʒss., or even ʒj

Therapeutic Action.—The tincture of the seeds of the Porcelia is said to operate very efficiently as an emetic in very small doses. Dr. Sellman, who has published a small pamphlet on Medicine, says the tincture of the seeds will produce emesis in doses of ten drops. The minute doses necessary to produce vomiting, and its freedom from unpleasant taste, recommend it as an emetic, especially in the diseases of children. We have administered it in much larger doses than are named by Dr. Sellman.

VIOLA.

THE ROOT OF VIOLA ODORATA.—U. S.

Preparations.—The powdered root. A tincture of the entire plant.

Dose.—Of the powder, ʒss. to ʒj. as an emetic; of the tincture, from the fraction of a drop to ʒss.

Therapeutic Action.—The root of this species of Viola is bitter and acrid, and possesses emetic properties. As an emetic it may be used in croup, whooping-cough, asthma, etc. Its action, however, is somewhat uncertain. Dr. Eberle remarks that it may be used in the cure of the *crusa lactea,*—℥j. boiled in Oj. of milk to one-third, and the whole taken in the course of twenty hours, to be continued for several weeks.

The leaves and flowers are demulcent, emollient, and laxative, and may be used with advantage in affections of the respiratory and urinary organs.

The Viola tricolor, or Pansy, the Viola pedata, and others of the violet species, are possessed of similar properties; all are mucilaginous, emollient, and laxative, and are useful in diseases of children.

ERYTHRONIUM.

THE LEAVES AND ROOT OF ERYTHRONIUM AMERICANUM.

Dose.—The dose of the recent root is from gr. xx. to xl.

Therapeutic Action.—The Erythronium is not much used as a medicine. It is said to be emetic, emollient, nutritive, and vulnerary. Dr. Eberle says that all parts of this plant are possessed of active properties. It is said to be an emetic of peculiar virtues in the early stages of dysentery.

The green leaves and roots are very valuable in scrofula, administered internally, and as a local application. For this purpose boil the plant in milk and apply it as a poultice to the scrofulous tumors, or ulcers; it is said to heal the ulcers, discuss the tumors, if not too far advanced, and if so to rapidly hasten the suppurative process. At the same time a decoction or infusion of the plant should be taken, which will facilitate the cure. The green leaves may be bruised and applied with advantage to ulcers and fresh wounds.

This agent loses its active properties by long keeping, and is then said to be nutritive.

DIRCA.

THE BARK OF THE ROOT OF DIRCA PALUSTRIS.—U. S.

Dose.—The dose of the pulverized bark of the root, as an emetic, is from gr. v. to x. As an expectorant in asthma it may be given in doses of a tincture from grs. iij. to v. every two or three hours. The decoction is expectorant and sudorific and may be made by adding ℥j. of the bark to Oj. of boiling water; let it stand where it will keep hot for an hour. Dose, ℥j. to ℥ij.

Therapeutic Action.—This agent is recommended in intermittent fever, asthma, chronic bronchial affections, etc., but as yet has been little used. In doses of from five to ten grains, it produces vomiting, preceded by a sense of heat and burning in the stomach, and followed by purging.

When the recent bark is applied to the surface, it produces redness, irritation, and finally vesication; but it is too slow as an epispastic to be of any importance.

SANGUISORBA.

THE ROOT OF SANGUISORBA CANADENSIS—U. S.

Dose.—The dose of the powder varies from gr. v. to x.

Therapeutic Action—Eberle says that the root of this plant is an excellent emetic, and may in most instances be substituted for the ipecacuanha, without any disadvantage. We have had no opportunity to test it.

TRILLIUM CERNUM.

THE ROOT OF TRILLIUM CERNUM.—U. S.

Dose.—It may be administered as an emetic, in doses from gr. x. to xv. every twenty minutes, until free emesis is produced. Care should be taken, however, that it does not produce hyper-emesis.

Therapeutic Action.—This article is sometimes, though rarely used as an emetic. It is said to possess properties which render it pretty active. Used in the South as an emetic in the forming stages of intermittent and remittent fevers, etc.

CENTAUREA.

THE LEAVES OF CENTAUREA BENEDICTA.

Dose.—The powder may be administered in doses of from ℈j. to ʒj. Decoction, as an emetic, ℥iv. to ℥viii. Warm infusion, as a diaphoretic, ℥ij. to ℥iv.; of the tincture gtt. j. to gtt. x.

Therapeutic Action.—A strong decoction, taken freely, acts as an emetic, and may be used for this purpose. It may likewise be employed to assist the action of other emetics.

A warm infusion, taken in less quantity, promotes perspiration, and may be resorted to, to fulfill this indication in colds, and in the forming stages of febrile and inflammatory diseases. It will be found valuable in cases of sudden suppression of the menses, arising from exposure to cold.

As a tonic and stomachic, we have found a cold infusion exceedingly valuable in cases of a languid and debilitated state of the stomach; it promotes the appetite, and gives energy to the digestive organs.

ROBINIA.

THE LEAVES AND INNER BARK OF ROBINIA PSEUDO-ACACIA.

Dose.—An ounce of the inner bark may be added to one pint of water, and boiled to half the quantity, and administered in doses of a wineglassful every ten minutes, until emesis ensues. A tincture might be employed in some cases of diarrhœa and dysentery.

THERAPEUTIC ACTION.—Black locust is emetic, cathartic, alterative, and tonic. The bark is possessed of mild, but pretty active emetic properties. It is particularly recommended in the early stages of dysentery, and is said to operate as a mild and certain emetic. Dr. Eberle says he has known it employed with as much advantage as is usually obtained from the ipecacuanha.

SODII CHLORIDUM.

COMMON SALT.

THERAPEUTIC ACTION.—Chloride of Sodium is emetic, cathartic, stimulant, tonic, anthelmintic, styptic or astringent, alterative, antiseptic, resolvent, refrigerant, and in large doses an irritant poison.

As an emetic it may be given conjoined with pulverized mustard seed in cases of poisoning by narcotics. One or two tablespoonfuls of the salt, and a teaspoonful of the flour of mustard, in a tumbler of water, will act promptly in such cases.

It has been employed in cholera in preference to other emetics. It has also been used in the same disease, by injecting it into the veins, as a stimulant, and powerful restorative, and likewise with the view of replenishing the blood with the saline and aqueous constituents removed by the excessive discharges from the bowels. This treatment, however, though giving temporary relief, was not successful.

In many cases of dyspepsia, this agent answers a valuable purpose as an emetic. It stimulates the stomach, and proves less debilitating than most agents of this class. In sick headaches, arising from a weak, languid, or foul state of the stomach, attended with, or dependent upon, large quantities of mucus lodged in that viscus, the salt often answers an admirable purpose as an evacuant. From one to two drachms, added to a tumblerful of cold water, and taken in the morning on an empty stomach, and repeated every twenty or thirty minutes, will generally produce emesis, and in the event of its failing to operate in this way, it will act mildly upon the bowels. It should be taken whenever the patient is attacked, or rather before an attack (which from its usual recurrences at stated intervals, may be predicted with considerable certainty), and persevered in till the disease is arrested, or the habit broken up.

Sometimes, though rarely, it has been used as a cathartic, but more frequently as a purgative enema.

In small doses it acts as a stimulant, tonic, anthelmintic, and alterative; and as such promotes the appetite, and facilitates digestion and assimilation. By giving tone to the stomach and bowels it corrects that morbid state of the digestive organs in children of debilitated habits, which is supposed to favor the generation of worms. In diseases where there is a depraved and vitiated state of the circulating fluids, common salt is a very efficient remedy. It is not only valuable as an internal agent, but is also very useful as an application to the surface, in the form of a bath.

As an astringent in hemorrhages, dysentery, diarrhœa, etc. salt is sometimes prescribed with lemon juice. It often proves effectual in checking hemoptysis, given dry in doses of a teaspoonful; a saturated acetous solution is also very useful, and often very effectual in checking dysentery and diarrhœas. For this purpose it may be dissolved in common vinegar made hot, till no more can be held in solution, then administer it in doses of one tablespoonful every hour or two till it gives relief, which it frequently does in a few hours.

It is a valuable antiseptic, and as such may be combined with poultices and applied to gangrenous parts; or it may be dissolved in brandy or spirits, and applied for the same purpose. A saturated tincture of it is beneficial as an excitant, counter-irritant, resolvent, and discutient, applied with brisk friction as an embrocation to tumors, glandular swellings and indurations, chronic diseases of the joints, as hydrops articuli, etc. The same may be applied in cases of strains, bruises, and similar injuries.

It constitutes a valuable antiseptic gargle, particularly in the malignant forms of cynanche. It may be dissolved in vinegar and sweetened with honey. Gum-myrrh, capsicum, or hydrastis, may be added with advantage. It is a useful refrigerant applied in the form of an acetous or aqueous solution to the head in cases of congestion and inflammation of the brain, or to the surface in cases of febrile and inflammatory excitement. It is sometimes applied to the chest in cases of fainting and asphyxia, as a stimulant.

It proves a valuable excitant and tonic when applied to the surface in the form of a cold solution, in cases of general debility. Applied as a bath (cold or warm as the case may require), it rarely fails to act as an excitant and tonic.

DOSE.—As an emetic, one half to one ounce., dissolved in a tumbler of water, acts promptly. As a cathartic, from two drachms to half an ounce. As a tonic and alterative, from ten grains to one drachm. As an injection, from one to two ounces, dissolved in a pint of water or gruel.

The following articles, if taken in suitable doses, frequently prove emetic, and are occasionally resorted to for this purpose.

In this place we shall merely refer to them as emetics, and postpone their further consideration till the classes to which they more properly belong are taken up.

POLYGALA.—The Polygala senega, Seneca snake-root, is sometimes used as an emetic. It is mostly prescribed for this purpose in cases of croup, asthma, bronchitis, etc. Dose, grs. xv. to xxx.

EUPATORIUM.—The Eupatorium perfoliatum, or Boneset, is occasionally prescribed as an emetic. If taken freely in the form of a strong decoction while warm, it produces gentle emesis. Dose, four to six ounces, repeated every ten minutes.

ANTHEMIS.—A strong infusion of the Anthemis nobilis, or European Chamomile, taken freely, acts mildly as an emetic; it may be substituted for more active agents.

The Anthemis cotula, or May Weed, and the Matricaria chamomilla, or German Chamomile, may be used for the same purpose. In their effects they much resemble each other. Dose, of an infusion of one ounce to one pint of boiling water, four ounces to eight ounces repeated every ten minutes.

MYRICA.—The Myrica cerifera or Bayberry, proves emetic if administered in large doses, and is occasionally resorted to for this purpose. Dose of the powder, one drachm, repeated every ten or fifteen minutes.

SCILLA.—The Scilla maritima or Squills, is a very acrid emetic. It is occasionally prescribed in croup, asthma, and bronchitis. Dose, grs. vi. to xii.

NICOTIANA—Nicotina tabacum, or common tobacco, though an active emetic, is rarely used, on account of its being so very prostrating to the patient; moreover, its acro-narcotic powers forbid its frequent internal use. It is occasionally resorted to as an emetic, in cases of great insensibility of the gastric nerves. Dose of the powder, grs. v. to vi.

SINAPIS.—The seeds of the Sinapis alba and nigra, or black and white mustard, are direct emetics, and are frequently resorted to for the production of emesis, especially when there is great torpor and insensibility of the nervous system, or when narcotic poisons have been taken. Dose of the pulverized seeds, one drachm to one ounce.

CELASTRUS.—The Celastrus scandens or False Bitter-sweet. is said to be emetic. One ounce of the bark of the root may be made into a decoction, by adding half a pint of boiling water. Dose, half an ounce, every fifteen minutes.

ASCLEPIAS.—The Asclepias incarnata, or flesh-colored Asclepias, is said to act as an emetic; we have no confidence, however, in its emetic powers.

ZINCI SULPHAS.—Sulphate of Zinc is employed as an emetic in cases of poisoning; it evacuates the stomach speedily, without giving rise to much nausea or prostration. Dose, grs. x. to grs. xx, in warm water.

CUPRI SULPHAS.—In cases of poisoning where other agents were not at hand, we should not hesitate to resort to the sulphate of copper to fulfill this indication. It operates speedily, and without much nausea or prostration. Dose, from grs. iv. to grs. xv.

ANTI-EMETICS.

As heretofore remarked, the remedies and methods which check nausea and vomiting, either by relieving gastro-irritation, overcoming gastric atony, removing sympathetic irritations and disease of associate viscera, are of quite as much importance as a knowledge of the means of producing emesis.

If there is any one thing which should be more thoroughly impressed upon the mind of a student than another, it is the necessity of keeping the stomach in good condition. The first inquiry in the examination of a patient is as to the condition of his stomach, for a man lives by his stomach. It must ask for food, receive it kindly, and do its part of the work of digestion. It must also receive the fluid necessary for the kindly working of the tissues, and be in a condition to permit and favor free osmose. The physician will also say that it must be in condition to kindly receive his remedies, furnish fluid for the solution of many of them, and permit their absorption through its walls.

The physician who abuses the stomachs of his patients by emetic, cathartic, irritant, nauseous, or in anywise unpleasant drugs, can not have great success in practice, and in the coming years will not be wanted. On the contrary, the physician of small doses, of pleasant remedies, for direct effect, and who has faith in a good stomach and a good dietary, will be the successful man.

HOT WATER.—Hot water is an admirable means of relieving nausea and checking vomiting in ordinary cases. Many times the patient is thirsty, but throws up any fluid that is taken. The water should be as hot as it can be swallowed, and taken in moderate quantities until the stomach is settled. In cases of dyspepsia with nausea occurring during digestion, an ounce or two of hot water is an excellent treatment. In cases of sleeplessness, difficulty in going to sleep, restlessness, and nervousness, a cup of hot water will be found to give great relief, and will aid in effecting a cure.

As a topical remedy in these cases, sponging the abdomen with hot water, is a very efficient means. The water should be as hot as can be borne, the sponge being rapidly passed over the surface. In from two to five minutes of this application, the abdomen may be covered with a hot dry flannel.

As an *enema*, hot water may be employed when there is great exhaustion, a feeble circulation, coldness of the surface and extremities, exhaustive discharges, or hemorrhage.

Cold Water. Ice.—In some cases spoonful doses of ice cold water, or simply rinsing the mouth frequently with cold water, will allay nausea, and relieve irritation of the stomach. When ice can be obtained, small pieces taken in the mouth are thought to be better than cold water.

The topical application of cold water over the epigastrium and abdomen is a very good treatment when the temperature is high. A towel wrung out of cold water is sufficient in minor cases, but in the more severe, with a temperature above 104°, the half pack will be better.

The *ice bag* (powdered ice in bladder, or even a lump of ice in a towel) is sometimes an admirable remedy applied over the spine in the upper dorsal region. I have used it in Asiatic cholera with success when no remedy, not even a drop of water, would be tolerated by the stomach.

As an *enema* cold water may be employed to relieve nausea and vomiting, when the temperature is high. I have seen it come down from 105° to 102° in an hour, by the injection of a pint of cold well water.

Chloride of Sodium.—Common salt in weak solution is a very certain remedy for the nausea and vomiting of the algid stage of diseases. I have used it in Asiatic cholera, in congestive intermittents, and in cholera morbus, with marked benefit. In some cases an enema of a weak solution cold is the quickest means of quieting the stomach. This is especially the case when the temperature is high, and there is great thirst.

Aconite.— Aconite in small doses (gtt. ij. to gtt. v., to water ℥iv.) is an excellent remedy to relieve irritation of the stomach, when the *pulse is small and frequent.*

Ipecacuanha.—As has been already noted, Ipecac in small doses (gtt. v. to gtt. x., water ℥iv.) is an admirable remedy to relieve irritability of the stomach, and check nausea and vomiting. It is usually combined with Aconite.

Nux Vomica.—Nux is the remedy for nausea and vomiting when the tongue is pallid, the lower part of the face pale or sallow, with feeling of atony in the stomach, or pain resembling colic. The dose should be small, gtt. j. to gtt. v., water ℥iv.; a teaspoonful frequently repeated.

Aromatics.—In some cases a mint water will be found an excellent remedy. Spearmint is to be thought of if there is a scanty secretion of urine. Occasionally some of the stronger stimulants may be employed to relieve atony of the stomach, and to give a better circulation and innervation.

Amygdalus.—The bark of the peach tree (the green sprouts) is an admirable anti-emetic. An infusion is made, and given cold.

Compound Powder of Rhubarb.—A cold infusion of this old-fashioned medicine gives good results in quieting the stomach.

Bicarbonate of Soda.—When the tongue is broad and pallid, a weak solution of bicarbonate of soda should be employed to relieve nausea.

Acids.—When the tongue is deep-red, a weak dilution of muriatic acid will check nausea and vomiting.

CLASS II.

CATHARTICS.

Cathartics are those agents which, by increasing the peristaltic action of the bowels, cause alvine evacuations. They embrace a very extensive class of remedial agents, and one, too, which is probably in greater use than all others taken together. In relation to the extensive, and we might say almost unlimited use, as well as paramount importance of this class, they are deservedly the most popular class of remedial agents in the materia medica. No disease afflicts frail mortality in which either the milder or more active agents are not thought to be either highly important curative or palliative means during most periods of its continuance.

Their employment is by no means confined to the practitioner of medicine; on the contrary, they are resorted to in domestic practice, in some of the infinite varieties of pills in common use, powders, salts, sulphur, magnesia, extracts, bitters, infusions, sirups, decoctions, etc., etc., either as active cathartics or as laxatives, more frequently, we presume, than all other remedial agents. They have been introduced into such general use from the fact that they are easy of administration, and so readily suggest themselves to the minds of the ignorant, and that their employment is so rarely followed by any immediate injurious consequences. They afford temporary relief in so many diseases, that they are considered as an universal panacea for every ailment. Every variety of cathartic agents have been employed in manufacturing cathartic pills, and colossal fortunes have been made by their preparation and sale. It may be said that the Americans are a drug-taking people—"*pills*" being considered by a majority almost as essential to well-being as bread, and more so than water applied externally, exercise, fresh air, etc. That great injury results from this indiscriminate use of cathartics is obvious, and it should be the duty of every conscientious physician to instruct the public mind on these and other subjects pertaining to health.

When used, however, with a definite object in view, and with a correct knowledge of the pathology of the disease for which they are given, they may be made to serve a useful purpose in medicine.

Action of Cathartics.—Cathartics may exert their influence in three different ways: 1st. By their irritant effect upon the intestinal tube; 2d. By absorption they are conveyed into the blood, and having a special affinity for the intestinal canal, they are excreted through it, and stimulate it to increased action; 3d. By causing an endosmosis from the capillaries to the alimentary canal, causing distention, irritation and evacuation.

Irritant cathartics are those agents which, being insoluble, are not absorbed after being taken into the stomach. They produce a topical irritation of the mucous membrane of the intestinal tube; this irritation is extended to the muscular coat (either directly or through the reflex action of the nerves), and the peristaltic action is quickened, their propulsive power is increased, and defecation accomplished. This action may in some cases only remove the contents of the bowels; but in others the stimulation is extended to the glands of the intestines, and they prove eliminative. They may also cause an endosmosis of the blood-serum, and prove hydragogue.

Specific cathartics are those agents which will produce catharsis, whether introduced into the stomach, thrown into the serous cavities, injected into the veins, or absorbed through the skin. They are soluble in the fluids of the alimentary canal, and hence are absorbed and act from the blood; having a special affinity for this portion of the system, they pass to it, and are excreted by the intestines. Why these agents have an affinity for the intestines, it is useless for us to speculate; we know the fact that certain agents pass to the bowels, others to the kidneys, to the skin, and other organs, and are excreted by them, but the cause of this will always remain a mystery.

This class of cathartics are always eliminative, stimulating the part through which they are excreted to increased action. What is the value of this *elimination?* It has been shown by Mekel that the mucous surface of the intestinal canal consists of about 1400 square inches, covered with a closely packed glandular apparatus; and from this large surface secretion and excretion is constantly going on. Of the function of these numerous glands, but little is positively known, yet it has been clearly proved by physiologists that the larger part of the feces is excreted from the blood through some part of it; that instead of this excretion being composed of undigested food, it is formed of the nitrogenized tissues of the body, which being worn out, are eliminated from the system in this manner. The advantage to be derived from this class of cathartics is, then, very apparent: they stimulate this immense glandular apparatus to increased action, and eliminate from the blood the products of disintegration and decay; they may also act as depletives, if this action is maintained, lessening the quantity of the blood.

The cathartic salts are supposed by many eminent authors to act by causing an endosmosis from the blood (the lighter fluid) to the solution (the heavier fluid), and by thus increasing the contents of the intestines their natural action is called into play, and their contents are excreted. It is also maintained that when the solution contains less than five per cent. of the salt it does not prove purgative, but diuretic, and is excreted by the kidneys. We do not feel willing to admit the entire physical action of this class of agents, and we think that a little consideration will convince any one that this is not a faithful description of their operation. For instance, an ounce of some purgative salt is placed in the stomach in a saturated solution; it will first cause an endosmosis of the blood-serum to the salt, but as the dense fluid has an affinity for the membrane, and passes to it, the part next the membrane becomes diluted, and is absorbed by the blood; we have thus an exosmose of the blood-serum to the salt, and an endosmosis of the solution to the vessels. Some portion, then, of the purgative agent is absorbed, and as the solution passes through the length of the intestinal canal, we might reasonably suppose that a considerable portion of it would be absorbed. This, then, acts specifically from the blood, and might be the cause of the purgative action, but most probably acts in conjunction with a portion which remains in the bowels.

This class of agents may be divided with much propriety into *laxatives* or *aperients*, and *cathartics* proper, according to their mildness or efficient mode of action.

Laxatives are but a subdivision of cathartics, and embrace agents which act but feebly or very gently upon the bowels, simply evacuating their contents without materially increasing any of the secretions. Among this class of agents we may name the manna, rhubarb, castor-oil, sweet-oil, sulphur, magnesia, etc.

Cathartics are those agents which act briskly and efficiently upon the bowels, not only evacuating their contents, but causing an increased secretion from them. Their influence extends to surrounding parts; they arouse the neighboring glands to increased action, stimulate the intestinal exhalants to increased secretion, and produce a very decided impression upon the general system. To this division of cathartics belong the podophyllum, jalap, iris versicolor, gamboge, croton oil, elaterium, etc.

This division is again subdivided according to the different effects which specific articles produce upon the system, and hence the terms *purgative*, *drastic*, *hydragogue* and *cholagogue*.

By *purgatives* is meant the mildest of the cathartics, as senna, castor-oil, rhubarb, etc.; the two last being purgative as well as laxative, if administered in suitable doses.

Drastics are those cathartics which are exceedingly harsh in their action, operating violently, and not unfrequently producing nausea, vomiting, tormina and tenesmus, and even gastro-enteric inflammation. Gamboge, scammony, podophyllin, and most of the resinous cathartics, are examples of this division.

Hydragogues are such cathartics as greatly augment the exhalation of fluid into the intestinal canal, and cause copious liquid evacuations. Jalap, elaterium, and some purgative salts belong to this division.

Cholagogues are such as exert a specific action on the liver, by removing obstructions and arousing it to action, thus causing copious bilious discharges. Podophyllum, podophyllin its active principle, and colocynth, are examples of this class.

These subdivisions are quite arbitrary, and might with much propriety be rejected; for the same article often possesses two or more of these particular properties, as the gamboge, colocynth, etc.

The same article often acts very differently on the same person at different times. At one time a particular agent may act as a mild *purgative*, and at another it may operate as a powerful and even *drastic* cathartic; depending upon the acute or diminished sensibility of the nervous system, or morbid irritability of the bowels.

Cathartics are also said to be *refrigerant*, when they greatly lessen the heat of the body, as the sulphate of soda, sulphate of magnesia, and supertartrate of potassa.

Those which determine the vascular afflux to the pelvic viscera, and act either directly or indirectly upon the uterus, promoting the menstrual secretion, are called *emmenagogue* cathartics. The aloes, black hellebore, etc., are examples of this class.

Cathartics vary much in regard to the part of the intestinal tube upon which they tend to act. Some act mostly upon the stomach and upper intestines, producing nausea, and not unfrequently bilious vomiting, or as *emeto-cathartics*. This effect arises from their influence being mostly exerted upon the superior part of the alimentary canal, as is the case with the podophyllum, gamboge, colocynth, etc. Others exert their principal influence upon the lower portion of this canal—the colon and rectum—as the aloes; while others act upon each and every portion of the intestinal tube, as the jalap, elaterium, colchicum, etc.

The reason why different cathartics seek out and act upon different portions of the intestinal canal, is involved in much obscurity. Some have attempted to account for it on the ground of the difference in solubility of the different agents; those most soluble being supposed to act most readily, and consequently upon the upper part of the canal; while those of difficult solubility act principally upon the lower portion of the canal, because they pass the upper portion without absorption. These explanations are by no means satisfactory; for the cathartic principle of the aloes is very soluble, and yet it acts upon the colon and rectum. It will likewise, as will other *specific* cathartics, affect the same portions of the intestinal tube, when absorbed from a serous cavity, from the skin, or when injected into the veins. We can only account for these different effects in the same manner that we account for the action of a specific cathartic. They have a special affinity for certain portions of the mucous membrane or glands, and are excreted by this part, thus stimulating it to increased action.

From what has already been said relative to the modus operandi of the different varieties of cathartics, it will readily be seen that the proper selection and adaptation of certain ones to the multiplied and ever-varying forms of diseases, is a matter of the first importance to the practitioner of medicine. Thus, if the patient be of a plethoric habit, if a high grade of febrile or inflammatory excitement exists, if the bowels are torpid, or there is an undue determination to the brain, or a dropsical effusion exists, a very different class of cathartics will be indicated, from those required where there is great exhaustion, as in the advanced stages of fever, in chronic diseases attended with great debility, in diarrhea and dysentery, and especially in cases of irritation or gastro-enteric inflammation.

THERAPEUTIC INDICATIONS.

In treating of the therapeutic application of cathartics, we shall speak of the different states of the system to which particular ones are adapted, and at the same time advert to the solid objections resting against others in the same or similar cases. As when describing emetics, we shall notice a few of the particular diseases in which cathartics are employed with advantage.

I. *Action in Torpor of the Bowels.*—In cases of torpor and inactivity of the bowels these agents are of primary importance. In this condition digestion is imperfectly performed, and frequently food is retained in an imperfectly digested condition much longer than the laws of health will tolerate, while retained it is mingled with the various products of secretion eliminated from the blood through the walls of the canal. This heterogeneous mass becomes more acrid and irritating, and we may add, disease-creating, in proportion to the time it is retained in the bowels. The more liquid portions are reäbsorbed into the blood, contaminating that fluid, causing sick-headache, pain in the back and limbs, fever, loss of appetite, etc. We may have the same results produced by the non-elimination of effete matters from the blood, owing to the torpid condition of the bowels; and in either case, if this condition continues, it may be the cause of many of the acute diseases; it also aggravates the symptoms in many chronic affections.

Thus, in this condition of the bowels, cathartics mitigate the symptoms in many inveterate chronic diseases; and in the milder acute diseases, such as colds, headache, jaundice, foul-stomach, slight attacks of a febrile and inflammatory character, they are often found entirely adequate to the relief of the patient without any, or with but very little other medicine.

II. *Action in Fevers.*—Too much importance can not be attached to the judicious use of cathartics in every variety, of either idiopathic or symptomatic fever. Thus in *intermittent*, *bilious remittent*, *continued*, *typhus*, *typhoid*, and in every variety of the *exanthemata*, as *measles*, *scarlatina*, *variola*, etc., either cathartics or laxatives are of great utility, and we might say almost indispensable.

In febrile and inflammatory diseases the bowels are usually constipated, and a continual accumulation is taking place in them. The great extent of surface, and the innumerable number of glands that are continually pouring out large quantities of excrementitious matter into it, renders it the common sewer of the system, the great receptacle into which most of those materials which have been worn out, or degenerated in the body are thrown. It is as one writer not inaptly remarks, "The great storehouse of disease;" in it all the redundant portions of our food are lodged, and into it most of the decayed particles of our organs, after they can no longer prove subservient to the purposes of the animal economy,—but if retained must necessarily act as foreign and disease-creating agents,—are thrown by the action of the intestinal exhalants.

While this vitiated mass is retained in the bowels, the fluid parts of it are constantly absorbed and conveyed back into the circulation, where it adds fuel to the excitement already existing. It not only vitiates the blood by its own presence, but by increasing the chemical changes that are taking place in that fluid, it thus predisposes to febrile and inflammatory diseases and often produces them. Cathartics very effectually counteract these morbid conditions by thoroughly evacuating the bowels.

An active cathartic is said to reduce the amount of circulating fluid from one to three pounds; in this way they act as powerful depletives. They serve to depress the vascular and nervous excitement, and moderate the intensity of febrile and inflammatory disease. These effects seem to arise in part from throwing off the vitiated accumulations in the bowels, and thus removing a source of irritation; and in part from stimulating the intestinal exhalants, and thus causing an abstraction of large quantities of serum; in this way they act as depletives and indirectly as sedatives.

Inasmuch as we are opposed to depletion by the lancet in the class of diseases termed sthenic, it may be said, If cathartics are such powerful depletives and carry off such large quantities of serum, they are quite as debilitating and therefore as objectionable agents as the lancet. The comparative physiological importance of the two constituents of the blood, viz.: the crassamentum and serum, readily unmasks the error, and enables us to answer the question satisfactorily. While the crassamentum or solids of the blood furnish all the materials for nutrition and secretion, supplying the waste of the body, stimulating the entire system to normal action, it is evident that the removal of any portion of it would produce a lasting and pernicious influence upon the system. On the contrary the serum serves rather as a medium or vehicle to transmit the crassamentum through the system to supply its wants, and is therefore comparatively unimportant. Not only so, but if largely diminished it may be speedily replenished by the free use of diluents. But this is not the case with the fibrine, albumen, and red corpuscles of the blood, highly elaborated and vitalized parts; if they are abstracted they are restored only by a very slow, vital process.

In depletion by the lancet, the entire blood is removed, both solid and fluid; by cathartics, the watery portions only are abstracted. In the one case the great restorative principle has been needlessly removed; in the other, an aqueous and less essential part, one which furnishes none of the materials of nutrition or reparation. The speedy recovery which follows from the loss of the serum, and the tardy recovery supervening upon the loss of the albumen, fibrine and globules, fully sustains us in the position we have taken. In one case, a few hours, or at most a few days are sufficient to restore the lost energies of the system; while in the other as many weeks, or even months may be required to accomplish the same desirable object.

If there is torpor, or congestion of the liver, and consequently congestion of the spleen and the entire portal system of veins, we have a class of cathartics that act directly upon this viscus. Almost any cathartic, however, will act indirectly upon the liver; this they do by causing an irritation of the duodenum, which is conveyed to the liver; and increased action is generally the result. Cholagogues are supposed to act directly upon this organ; thus podophyllin, leptandrin, etc., we suppose have a special affinity for it, and are probably partially excreted by it.

Cathartics exert a very powerful influence over the secretions of the glandular system, and also over the various secreting surfaces. In short, they act as depletives, and indirectly as sedatives; while at the same time they increase, and often effectually and speedily restore all the secretions.

Another important influence exerted by cathartics is their revulsive effects. In cases of inflammation, congestion, or any undue excitement in the brain, the strong impression which an active cathartic makes upon the bowels, renders them powerfully derivative, as well as depletive agents; and hence they often afford prompt relief. In such cases an active hydragogue cathartic should be prescribed.

In cases of congestion of any of the abdominal, or thoracic viscera, occurring during the progress of febrile disease, their influence is transmitted from the bowels to the neighboring organs, by contiguous sympathy, and relief obtained. They act as revulsives, and as direct topical depletives.

If the nervous system is oppressed, or overpowered by the presence of vitiated material in the blood, or by any morbid accumulation in the bowels, or by congestion of any organ; or if the vascular and nervous energies are concentrated upon any particular part, cathartics are exceedingly valuable in removing the oppression, and equalizing nervous and vascular excitement.

In the treatment of febrile and inflammatory diseases, the constitution and habit of the patient, or state of the system at the time, will enable the judicious physician to select the proper cathartic to meet the indications that may be present. In an attack of bilious remittent, or a synochal grade of continued fever, if the constitution is vigorous, and the patient plethoric, very active and powerful hydragogue cathartics, if administered early, will be found most effectual in arresting the progress of the disease. An emeto-cathartic will fulfill more indications than those of an opposite character; they do this by acting more efficiently on the various secretory organs, and by the shock which they impart to the nervous system. They often break the chain of morbid associations, and arrest the disease when milder agents would fail.

In the early stages of fevers, active cathartics may be repeated every second or third day, if required; but as the disease advances less active agents, as the mild purgatives, and if there is much prostration, laxatives, will be found the most appropriate evacuants.

If the constitution of the patient is naturally feeble, or has become enfeebled by a protracted disease, or gastro-intestinal inflammation exists, the active, drastic hydragogue, or cholagogue cathartics would be inadmissible; none but aperients, or the milder purgatives should then be administered.

It may be proper to state, that this class of agents were at one time regarded as objectionable in the treatment of typhus and typhoid fevers, from the debility which they were supposed to produce, in addition to that already existing. Experience, however, has long since decided in favor of their employment in these diseases. Dr. Hamilton, in his remarks on their use in typhus fever, says: They cleanse the tongue, mitigate thirst, restlessness and heat, by removing vitiated matters from the intestines, which would morbidly impress the nerves, and produce debility if retained. They render recovery more certain and speedy, and instead of debilitating, actually increase the strength. The new excitement in the nervous system weakens the train of morbid sympathies, and hastens convalescence, independent of their evacuant effect.

In the early stage of yellow fever, cholagogue cathartics are employed with advantage; in the advanced stages, mild laxatives only should be used.

In the exanthematous fevers, as variola, rubeola, scarlatina, etc., active cathartics can not be employed without great danger of increasing the severity and danger of the disease. If they are employed during the stage of eruption they determine the circulation to the intestines; and if they do not produce a retrocession of the disease, they produce a similar eruption on the mucous membrane to that which exists in the skin. In the early stages, however, the bowels should be evacuated; but this should be accomplished by using such agents as produce the least irritation. After this the bowels should be kept in a soluble condition by the use of the mildest laxatives. These diseases are self-limited, and by no mode of medication that we can adopt can we expect to arrest their progress. They run a specific course, and by the administration of medicines our sole object should be to moderate the intensity of the symptoms, prevent congestions, retrocessions, etc., and not with a view of cutting short its course, as is our aim in other varieties of fever.

III. *Action in Dropsy.*—Cathartics are by no means an un important class of remedial agents in hydropic affections. Perhaps there is no class of therapeutic agents which so effectually arouse the absorbent system as the one under consideration. We think we hazard nothing when we say they occupy the front rank in the treatment of these complaints. If it is said that diuretics should have the preference, we must determine this question by referring to the salutary effects following the independent administration of each. Their relative importance can be ascertained by administering them separately, and comparing the effects resulting from the use of each respectively. The utility of diuretics in dropsy is greatly increased by being preceded by the use of proper cathartics. Cathartics stimulate the secretions of the entire alimentary canal; they remove congestions, determine the circulation to the large mucous surface of the intestinal tube, and cause an endosmosis from the capillaries to the intestines, by which it is removed from the body. This irritation and determination of the blood to the bowels gives increased motion to the circulation, and by the removal of large quantities of fluid from the vessels, the mass of the circulating fluids is decreased. As soon as there exists a depletion of the sanguiferous system, there is an immediate absorption by the veins, to restore the lacking fluid; this absorption, if there is not large quantities of fluid ingested, will be taken from the dropsical effusion. A sluggish circulation of the blood always predisposes to dropsy, and without the circulation is stimulated, absorption does not take place. Here we have a marked difference between the two classes of agents: diuretics will remove the watery parts of the circulating fluid, but they do not stimulate the circulation, and consequent absorption; while cathartics not only remove the fluid, but stimulate the circulation and produce rapid absorption. After cathartics have produced the effects just referred to, diuretics will exert their full influence in removing the fluid.

The most useful cathartics in these diseases are such as not only produce watery discharges, but stimulate or irritate the intestinal surface. These agents are termed *hydragogues*, from producing large fluid discharges. These, with the exception of the purgative salts, are all acrids. When the purgative salts are employed for their hydragogue properties, they are generally combined with some irritant cathartic, as jalap, colocynth, etc. Elaterium may be referred to as the type of hydragogue cathartics.

Dropsy is a morbid, serous effusion, or accumulation of serum in any of the cavities of the body, or in the cellular tissues—following as the sequel of many chronic diseases, particularly those of the kidneys, and not unfrequently from a subinflammatory action of some of the serous membranes.

It is in many cases dependent either upon local or general debility.

It seems to be a physiological law that the relative proportions between the solids and fluids, and also between the different constituents of the fluids, should be maintained. If blood be abstracted by the lancet, or by hemorrhage, or if the serous portion alone be removed by the action of a cathartic, or by any other cause, increased absorption from internal cavities immediately follows, to replenish the loss, and restore the equilibrium. If no dropsical effusion exists, and fluids be taken into the stomach, or injected into any of the cavities, they are rapidly absorbed to supply the place of that removed, and to maintain the relative proportions between the different constituents of the blood. It may be proper to state that, in cases of ascites, for instance, where the effusion is great, causing a deficiency of serum in the blood, this deficiency is counterbalanced by the diminished action of the kidneys and cutaneous exhalants.

Pathological observation and direct experiment both confirm the position that absorption is tardy when there is vascular repletion; and that it is accelerated in proportion to the extent to which depletion is carried.

Cathartics stimulate the intestinal mucous exhalants, and cause them to pour into the bowels large quantities of serum, and consequently a deficiency of fluid must exist in the bloodvessels. The constant efforts of the system to maintain the due amount of serum in the blood by absorption, and the increased activity of this process, in proportion to the reduction of the serous fluid, enables us to explain satisfactorily the modus operandi of cathartics in dropsies. They destroy the balance existing between the different constituents of the blood, by removing the serum, and at the same time greatly diminish the amount in circulation; and in proportion to these effects will be the activity of absorption of effused serum from the cavities in which it is deposited. The serum, after being reäbsorbed, often stimulates the kidneys to increased activity, and in this way they act indirectly as diuretics. Cathartics, if given in conjunction with diuretics, often greatly increase their diuretic powers; absorption continues more active for several days after the action of the cathartic has ceased—increased diuresis being the result.

The derivative power of cathartics also renders them important agents in diminishing dropsical effusions. The part from which effusion takes place necessarily becomes the center of fluxion; but by the action of a cathartic upon the bowels, the point of fluxion is changed; at least a new, though temporary one is established. The action of a cathartic upon the intestinal exhalants exerts a powerful derivative influence, and while the bowels are the seat of derivation as well as exhalation, the dropsical effusion and local determination must necessarily be reduced; the materials to supply exhalation and the morbid action being diverted from the point of original excitement. In this way, an opportunity is afforded for the enfeebled organ or part to recover its tone, and for its functions to become improved. In all cases a fixed irritation or point of excitement is attended with accompanying loss of action in other parts of the system—abnormal or redundant secretion of one organ or tissue is accompanied with a diminution of the secretory action of other organs; or if one organ becomes diseased, and its normal secretion is arrested or reduced in quantity, it is compensated by the vicarious action or corresponding activity of some other organ, to supply its place.

IV. *Action in Diseases of the Brain.*—In all cases attended with an undue determination to the brain, as in apoplexy, phrenitis, cerebral congestions, etc., they are preëminently important. In these cases, the most powerful drastic hydragogue cathartics should be employed, if no symptoms are present to contraïndicate their use.

Their salutary effects are dependent upon their depletive and revulsive powers. In most cases of oppression of the brain arising from a congestion of the cerebral vessels, large quantities of the most active class of cathartics will often be required to produce even moderate purgation The nervous sensibilities are so deadened that all medicines fail to produce their ordinary effects upon the patient; hence the necessity of administering cathartics without regard to their usual doses; the only criterion to determine the quantity to be used, being the results which follow from their employment.

The same remarks apply in cases where the narcotic poisons have been taken in over-doses. Derivation and depletion are the most important indications fulfilled by the employment of cathartics in these diseases.

V. *Action in Diseases of the Liver.*—In chronic hepatic diseases their importance is fully established. When the liver is torpid, or when it fails to furnish the proper quantity of the biliary secretion, or when there is jaundice, or congestion of the portal veins, and consequently of the abdominal viscera (all of which are of frequent occurrence), cathartics are of unquestionable utility. For restoring the biliary secretion, and removing the hepatic and portal congestion, the materia medica furnishes no agents equal to *cholagogue* cathartics. They act directly upon this organ, in addition to their cathartic effect, stimulate its secretion, and thus facilitate the passage of the portal blood through it. Their derivative action on the mucous membrane of the bowels, likewise assists to increase this secretion, by causing a determination of blood to this part; they increase the quantity which has to pass through the liver, and thus indirectly cause a determination to the liver.

The beneficial action of those agents which, while they act directly upon the liver, do not produce any irritation of the bowels, is very marked in many diseases. Thus, in chronic inflammation of the stomach, small intestines, etc., accompanied by torpor of the liver, such an agent as the leptandra virginica or leptandrin, which will stimulate the liver to increased action, increase the flow of blood through it, and thus remove the venous congestion of the inflamed organs, without increasing the inflammation by direct irritation, can not but be considered as meeting most of the indications to be fulfilled. As an example of such a condition, we may refer to the diarrhea or cholera-infantum of children: in this disease we have a low form of inflammation of the small intestines, which in nearly every instance is accompanied by hepatic torpor. The agents just referred to remove this torpor without irritating the bowels, and by thus removing the congestion, a cure often results. This same class of agents prove very beneficial in hemorrhoids for the same reason: they increase the flow of blood through the portal veins, and thus the congestion of the hemorrhoidal, which is the lowest part of the portal circulation, is removed.

In acute or chronic inflammation of the liver, cathartics that produce an irritation of the bowels are contraïndicated. They prove injurious by causing an increased determination of blood to the mucous membrane of the bowels, which blood has no means of returning into the general circulation but by passing through the liver in the portal veins; the action of such a cathartic then, is to cause a venous congestion of the liver, thus directly increasing the disease. Instead of such cathartics, those only which exert a very mild action should be employed—the purgative salts with some slightly stimulating, vegetable agent, being the most useful. Such a combination evacuates the bowels without producing irritation, and at the same time causes an endosmosis of the blood-serum to the canal; and thus proves directly depletive to the liver, by removing that which would otherwise pass through it.

VI. *Action in Chronic Disease.*—In chronic diseases, as in marasmus, scorbutic affections, scrofulous and cancerous habits, herpetic disorders, in all the various forms of inveterate and protracted cutaneous diseases, in obstinate and ill conditioned ulcers, syphilitic and mercurial cachexy, in short in all the varied forms of disease manifested by a vitiated or depraved condition of either fluids or solids, cathartics are valuable auxiliary medicines. They act as depuratives, cleansing the stomach and bowels of any morbid materials lodged or generated in them, they excite the glands to increased action and thus eliminate morbid material from the circulating fluid. They are thus important depuratives, and with propriety might be called alteratives—at all events they prepare the way and act as auxiliaries to the proper alterative agents.

VII. *Action in Amenorrhea.*—This is another disease in which cathartics may be prescribed with advantage. Emmenagogue cathartics are preferable in some cases, while in others, the refrigerant, deobstruent and hydragogue classes are those to which experience points as being best calculated to fulfill the desired indications. If the patient becomes languid or phlegmatic, and a chlorotic state supervenes, tonic and emmenagogue cathartics are proper. In this state of the system there is evident inactivity of the uterine vessels, evincing the want of a due concentration of the vital and vascular afflux to the pelvic viscera; such agents, therefore, as the aloes, black hellebore, etc., by causing a determination to the pelvis will prove the most efficient. It must be remembered, however, that the system is in such a condition that it can not bear depletion, and therefore these agents must be combined with chalybeates, tonics and stimulants, nutritious food and exercise.

On the contrary if a sudden suppression arises from cold, from an attack of some other disease, or from sudden and strong mental emotions, as grief, fear, anger, etc., in a patient of a plethoric habit and a vigorous constitution, then some of the hydragogue and refrigerant cathartics should be employed, aided by nauseating diaphoretics, perhaps emetics, warm fomentations to the pubic region, hip-baths, etc. In such cases depletion and relaxation are indicated. The object is to subdue exalted organic action, and remove the spasm of the extreme uterine vessels, when the arrest is dependent upon cold and torpor of these vessels; and when it results from some strong mental impression, the object is to restore the vascular and nervous afflux to the uterine system from which it has been withdrawn.

VIII. *Action in Dysentery.*—Cathartics are important therapeutic agents in the treatment of dysentery. Generally, the upper portion of the alimentary canal is in an obstinate state of constipation, while some portion of the large intestines is in a state of high inflammatory excitement. The morbid secretions mingled with the imperfectly digested aliment, constitute a vitiated and highly irritating mass, which if retained in the bowels would augment the intensity of the disease. There is, likewise, in a majority of cases, torpor of the liver, and consequently congestion of the portal veins; the veins of the lower bowel being the most dependent of these, we have a constant venous congestion at the seat of the inflammation. The bowels become tumid and painful, and a high grade of arterial excitement follows. To remove this vitiated accumulation, stimulate the liver to action, and thus remove the venous congestion, and moderate vascular excitement, we have no substitutes for cathartics. Violent dysenteric tenesmus is likewise often speedily relieved by their action. They make a new impression upon the bowels, which is substituted for the original and morbid one.

In the early stages of dysentery, active, but not drastic cathartics are indicated — such as act principally upon the upper portion of the intestinal canal, and specifically on the liver. Subsequently the milder ones, or the proper laxatives—as rhubarb, magnesia, castor-oil, etc.—should be substituted.

IX. *Action in Puerperal Fever.*—In puerperal peritonitis active and even powerful purgatives are of immense importance. If administered early they not unfrequently arrest the disease with the aid of but very little other medicine. The evacuant, and consequently the deplĕtive and sedative powers of refrigerant hydragogue cathartics, in lessening vascular excitement, and reducing the inflammatory action attendant upon this disease, render them one of the most, if not the most important class of medicinal agents.

X. *Action in Rheumatism and Gout.*—Arthritic and rheumatic affections demand the use of this class of agents — at least they are valuable auxiliaries to other remedies. Gout is generally connected with torpor of the liver and portal circle, together with functional derangement of the digestive organs; consequently suitable cathartics are of much utility in that affection. In arthritic and rheumatic complaints, the antiphlogistic power of cathartics tends much to the reduction of the inflammation. Their revulsive as well as cathartic and depletive properties, may aid in satisfactorily explaining their modus operandi in these affections.

XI. *Action in Pneumonia.*—In pneumonia, during the early stages of the disease, cathartics are a valuable class of auxiliary medicinal agents in reducing the inflammation. In the advanced stages of pulmonic inflammation, after free expectoration is established, there is strong objection to active purging, from its debilitating effects. In the early stages of the disease, they prove advantageous, principally from their derivative effect, and from lessening the amount of the circulating fluids. The irritation which they produce causes an increased flow of blood to the mucous membrane of the bowel, and hence the lungs are more or less relieved. As the disease progresses, however, nothing but the mildest purgatives should be employed, and these only to keep the bowels in a soluble condition; and when given they should always be combined with a sufficient stimulant, to counteract their debilitating effects.

XII. *Action in Hypochondriasis.*—In this disordered condition of the system, cathartics which act freely, without causing irritation of the bowels, have been found useful. In these diseases there seems to be a disordered state of the nervous system, arising probably, in most cases, from a dyspeptic and depraved condition of the stomach, functional derangement of the liver and torpor of the portal circulation, a costive state of the bowels, and disordered functional condition of the entire chylopoiëtic system. All of these symptoms will frequently yield to a persevering course of cathartics. Much advantage may be derived by combining them with antispasmodics—particularly with the fetid gums.

There are numerous other diseases in which cathartics prove very advantageous; but having pointed out, and as we trust, clearly illustrated the most prominent therapeutic indications which they fulfill in arresting disease, we shall leave the practitioner to apply them, as his judgment may direct, in the many various conditions of the system in which they may be indicated—but recollecting that as they are powerful agents for good when rightly applied, they produce much injury when improperly used.

RECAPITULATION.

The importance of this class of agents, and the great length of this chapter, may render a synopsis of the indications which they are supposed to fulfill, not only interesting to the student, but highly instructive.

1st. They remove the vitiated accumulations in the primæ viæ, and thus free the system from a frequent source of irritation and fever.

2d. They stimulate the glands of the bowels to increased action, and thus cause the elimination of morbid material from the blood.

3d. Some of them, termed cholagogues, act specifically upon the liver, stimulating it to increased action; they thus increase the secretion of bile, and by permitting the free flow of blood through this organ, remove congestion of the portal system of veins.

4th. They reduce the quantity of the circulating fluids; acting as depletives they reduce the momentum of the circulation. If there is congestion or inflammation of any of the abdominal viscera, they act as topical or local depletives. For these reasons they are of great importance in febrile and inflammatory diseases.

5th. They act as revulsives. Hence their great value in apoplexy, phrenitis, cerebral congestions, and thoracic and abdominal engorgements.

6th. They promote absorption: first, they lessen vascular repletion, and absorption is active in proportion to the reduction of the circulating fluids; second, they remove the serous portion of the blood exclusively, and thus destroy the balance between the different constituents of the blood. The laws of physiology require the maintenance of each of its constituents in due proportion, and for this reason the activity of the absorbents is increased, to restore the lost balance between the constituents of this fluid, as well as between it and the solids.

7th. They equalize the circulation, and thereby counteract local congestion and inflammation.

8th. They are deobstruent and depurative, tending to remove any obstructions in the glandular or lymphatic systems, and promote all the secretions.

9th. They promote nutrition by a direct, and also a sympathetic action, which they exert upon the entire digestive apparatus; they cleanse, energize, newly impress and restore its functions.

10th. In diseases of a general character, either acute or chronic, they newly impress the nerves, arrest existing morbid impressions, break up abnormal sympathies between different organs of the body, or so weaken them as to greatly assist the action of other remedies.

JALAPA.

THE ROOT OF IPOMÆA JALAPA.—Mexico.

Preparations.—The powdered root. A tincture. The resin. Compound powder of Jalap.

Dose.—Of the powder, grs. x. to grs. xxx. Of the tincture, gtt. x. to ʒss. Of the resin, gr. j. to grs. x. Of the compound powder, ʒss. to ʒij.

Therapeutic Action.—Jalap, in powder and in its resin, acts efficiently upon the bowels, causing nausea, sometimes vomiting and copious alvine evacuations, and if the dose is large, violent hypercatharsis and after-griping. Dr. Christison says, that severe and even dangerous effects have followed its use. If it ever acts dangerously, when administered in ordinary doses, it must be in rare cases, and when other agents of this class, though usually mild in their effects, would produce like results. It is a very safe and convenient cathartic.

Jalap is an active hydragogue cathartic, operating to some extent upon every portion of the alimentary canal, but its influence is mostly expended upon the small intestines. It stimulates the intestinal mucous exhalants, and causes copious watery discharges. As a cathartic, we have but few agents that act so briskly, so kindly, and yet so certainly, safely, and thoroughly.

As a detergent, deobstruent, and hydragogue cathartic, it is prescribed with great advantage in febrile and inflammatory diseases. As a derivative, it is among the best of this class of agents, and is, therefore, employed in encephalitis, and other diseases in which this derivative action is desirable.

It is very effectual in cleansing the alimentary canal, removing torpor, congestions, relieving vascular repletion, equalizing the circulation, and subduing organic excitement. If given in combination with the bitartrate of potash, it forms a very effectual refrigerant and antiphlogistic cathartic. The same combination is very valuable in dropsy. It removes large portions of the serum of the blood, which causes a rapid absorption of the effused fluid to replenish the waste. It may also be combined with the podophyllum or podophyllin, or small portions of the Elaterium in the same disease. Two or three grains of Ipecacuanha added to fifteen or twenty grains of Jalap, enhances its cathartic powers, and causes it to operate much more efficiently than a much larger portion of the Jalap alone.

RHEUM.

THE ROOT OF RHEUM PALMATUM.—ASIA.

PREPARATIONS.—The powdered root. A tincture. Compound powder and compound syrup.

DOSE.—Of the powder, gr. j. to grs. xxx. Of the tincture, gtt. j. to ʒss. Of the compound powder (an infusion of ℥ss. to ℥iv), one teaspoonful. Of the compound syrup, from gtt. x. to a tablespoonful.

THERAPEUTIC ACTION.—Rhubarb is cathartic, astringent, tonic, and stomachic, In small doses it acts as an astringent tonic upon the digestive organs, promoting the appetite, and aiding digestion. It checks diarrhœa, and improves the condition of the alvine evacuations. It acts slowly and mildly as a purge, seldom causing any griping, and is often followed by constipation. It is said by some authors to aggravate febrile and inflammatory action in some cases. It renders the milk of the nurse purgative, and imparts to the secretions its yellow tinge. It may be said to occupy an intermediate position between tonics and drastic cathartics, in its mode of action.

As a cathartic, it is peculiar and highly important. Its peculiarity arises from its singular combination of properties; it is both cathartic and astringent, its cathartic action not seeming to be affected by its astringent influence. In addition to these properties, it is mildly tonic and stomachic.

As a cathartic, the rhubarb is not an active or efficient one, and yet it is of great value, and one for which we may search the materia medica in vain for a substitute. It is not important, nor is it a proper cathartic to be prescribed in the early stages of fever, or during high grades of febrile and inflammatory excitement; neither is it suitable for the treatment of dropsy. It does not deplete, but simply evacuates the bowels, without reducing the volume of circulating fluids by stimulating the intestinal exhalants; neither does it arouse the glandular system, restore the secretions generally, or equalize the circulation; hence it is unimportant in the early stages of the diseases to which reference is made. It is, however, of the first importance in another class of diseases, and even in the advanced stages of these mentioned. Its peculiar efficacy is conspicuous in dysentery, diarrhœa, cholera infantum, and in atonic states of the bowels—wherever the intestinal canal is in a relaxed or atonic state. In fevers of a typhoid type, in the advanced stages of all febrile and inflammatory diseases, after active purgation would be no longer admissible, this is an appropriate cathartic. It is also very useful in chronic disease, when there is debility of the system, and in those forms of dyspepsia attended with diarrhœa. In short, in all cases of general debility where cathartics are indicated, and in feeble and relaxed states of the bowels, this is one of our most valuable medicinal agents. It does not exhaust the energies of the general system, but invigorates them, while at the same time it evacuates the bowels by its action on the muscular coat, upon which writers suppose it to exert its principal influence.

It is often combined with prepared chalk and cinnamon, and administered in diarrhœa, especially in the treatment of children. In large doses it acts first as a cathartic, and secondly as a tonic and astringent. In small doses it acts as a laxative or aperient, and as a tonic or stomachic, and astringent.

PODOPHYLLUM.

THE ROOT OF PODOPHYLLUM PELTATUM.—U. S.

PREPARATIONS.—The powdered root. A tincture. Podophyllin.

DOSE.—The dose of the powdered root is from gr. j. to grs. xxx. Of the tincture, from the fraction of a drop to gtt. xx. Of podophyllin, from 1-100 of a grain to gr. j.

THERAPEUTIC ACTION.—Podophyllum is cathartic and alterative, and exercises a specific action on the liver. It produces irritation and suppuration when continually applied to the skin, and irritation when applied to mucous membranes. Taken in small doses it acts slowly as a cathartic, producing but little if any nausea; but when administered in large doses it produces violent emeto-catharsis. Though we have no well authenticated instances of death being produced by its administration, yet we have seen severe and long-continued gastro-intestinal irritation follow its injudicious use.

As a cathartic it is one of our most valuable indigenous remedies; and indeed one of the most important in the materia medica. It is a safe, certain, tolerably active deobstruent, and hydragogue cathartic, operating very efficiently, though not so promptly as jalap (which in its action it resembles), and some other agents of this class; yet when it commences operating, its action is continued for a longer time. Considering the thoroughness of its action, it produces but little tormina; though in full doses it often operates as an emeto-cathartic, causing great nausea, and protracted vomiting. It leaves the bowels in a lax or soluble condition for a long time.

During the early stages of many febrile diseases, particularly intermittent and bilious remittent fevers, Podophyllum is an agent of superior efficacy. A single dose often arrests the severest attacks of fever. The nausea and vomiting, the depletion, its derivative powers, the general relaxation, the active and protracted influence upon the bowels, together with its powerful action upon the glandular apparatus, particularly upon the liver and portal circle, render it an article of great importance in these cases.

During the early stages of all fevers, and even after the disease is somewhat advanced, if there is not a state of prostration contra-indicating the use of any active cathartic, this article will prove one of our most valuable curative agents. It is also valuable in most inflammatory diseases. One of the principal sanative uses of this agent arises from its protracted action, thus preventing a recurrence or subsequent exacerbation of the fever; another is its powerful derivative and deobstruent influence upon the system.

In torpor or congestion of the liver, in jaundice, in any derangement of the hepatic functions, mercury, that *Samson* of the materia medica, dwindles into insignificance when compared with this simple and common plant.

In chronic or mercurial rheumatism, in scrofulas, in enlargements or indurations of the glandular system, and in torpor of any of the secretory organs of the body, the podophyllum, as an alterative discutient and revulsive cathartic, stands, we believe, altogether unrivaled in the list of remedial agents. In syphilis, during its primary, secondary, or tertiary stages, as an excitant and alterative, as well as a cathartic or aperient, it is of unquestionable importance. In short, in all these chronic diseases, the podophyllum is so searching in its influence, leaving not a single organ, tissue, gland, or secreting surface untouched, as to command an enviable pre-eminence, compared with other agents in common use. The continued or occasional use of it, either as a cathartic or as an aperient, throughout the whole course of medication, is strongly recommended in the chronic diseases named, from the sanative influence secured by the administration of it, during many years, and in a large number of inveterate cases.

It is beneficial in cases of dyspepsia, especially when attended with a torpid state of the liver and bowels; it restores the secretion of the liver, and promotes intestinal secretion, and most effectually counteracts constipation.

As a hydragogue cathartic, it proves highly antiphlogistic in synochal grades of fever, and in high grades of inflammatory action; and this influence is materially increased by combining it with the bitartrate of potash. The same combination is one of great utility in dropsy: one-drachm of podophyllin combined with five drachms of bitartrate of potash, and given in drachm doses, and repeated five or six times per day, will produce profuse watery evacuations, and rapidly remove dropsical effusions. In those forms of dropsy arising from visceral obstruction the same combination will be found very useful as a deobstruent and hydragogue cathartic. In amenorrhœa dependent on cold, or arising from torpor of the uterus, a single dose of this agent will often speedily restore the uterine secretion, even when the obstruction has continued for several months. It is recommended to be administered on going to bed, as it is less apt to produce nausea and unpleasant effects.

Specific Indications.—Full tissues, full veins, full abdomen, full tongue dirty from base to tip, heavy headache, giddiness.

Specific Uses.—Following the indications as above, the reader can not go astray in the use of this remedy, whether he gives it in large or small dose. It does not make any difference what the name of the disease may be, or where it is located, if indicated, Podophyllum will aid the cure.

I wish to call especial attention to the remedy in diseases of the brain, especially those marked by dizziness and weight in the head, and imperfect command of the muscles. In these cases it stands first among remedies, iodide of ammonium holding the second place.

In small dose, podophyllin is a stimulant to the sympathetic nervous system. Whilst its action is especially upon parts supplied from the solar plexus, it influences the respiratory nerves in a marked manner, and in a less degree the hypogastric. As a remedy in atonic dyspepsia, it holds a prominent place.

I find in practice that the small dose is quite as good as the large one in the majority of cases. Even if I wished to influence the liver, I should give a single dose daily of podophyllin gr. 1-20, hydrastia gr. ¼, rather than the old-fashioned dose. The same is the case in disease of the brain, and in many other cases.

I usually carry the remedy in the form of small sugar-coated pills, each containing podophyllin gr. 1-20, hydrastia gr. ¼. A second decimal trituration is an excellent form in which to administer the remedy, especially to children.

JUGLANS.

THE INNER BARK OF THE ROOT OF JUGLANS CINEREA.—U. S.

PREPARATIONS.—A decoction of the bark. A tincture. A hydro-alcoholic extract.

DOSE.—Of a decoction, from ℥ss. to ℥j. Of the tincture, ʒss. to ʒj. Of the extract, gr. v. to grs. xx.

THERAPEUTIC ACTION.—Juglans is a mild but pretty active cathartic, producing but little if any pain, and not debilitating the bowels. In this respect it resembles rhubarb. In combination with podophyllum or podophyllin it is very valuable in remittent and intermittent fevers, particularly in those cases attended with hepatic torpor and visceral congestion.

In small doses, combined with demulcents and aromatics, we find it useful in dysentery; it does not irritate, nor does it debilitate the bowels, but acts as a gentle laxative. In habitual constipation we know of no article superior to it. It operates kindly, restores the intestinal secretions, quickens the peristaltic action of the bowels, and leaves them in a lax and soluble state longer than any article with which we are acquainted.

A strong decoction of the bark has long been used in some parts of the country as a popular remedy for intermittent fever. It is given during the intermission, so that the patient will be under its influence at the time for the next paroxysm. It is given in wineglassful doses, and, according to report, operates so briskly that if the patient wished to, he would not have time to *shake*. It forms an effectual cure, if reports are to be believed.

The inner bark, scraped and moistened, and applied to the surface, acts as a vesicant.

A syrup may be made by boiling the bark until a strong decoction is obtained, then adding loaf sugar, ginger, and one-fourth as much brandy as there is of the liquid. This syrup is useful in dysentery, diarrhœa, bowel complaints of children, and in any case in which a mild and agreeable cathartic and laxative are required.

The *Juglans Nigra*, or *Black Walnut*, is sometimes used for medicinal purposes. The rind of the unripe fruit is applied to ring-worm and tetter, which it is said to remove, while the decoction has been used as a vermifuge.

The *Juglans Regia*, or *English Walnut*, is also used. The rind of the fruit is anthelmintic, and the expressed oil of the kernel laxative and destructive to the tape-worm; while the expressed juice or extract of the leaves has been found highly efficacious in scrofula. It has, indeed, of late attained much celebrity in the treatment of scrofulous affections; and, from reports, it merits still further investigation.

CONVOLVULUS.

THE ROOT OF CONVOLVULUS PANDURATUS.—U. S.

Preparations.— The powdered root. A tincture. A hydro-alcoholic extract.

Dose.—Of the powder, grs. xx. to ʒss. Of the tincture, gtt. v. to gtt. xx. Of the extract, gr. j. to grs. v.

THERAPEUTIC ACTION.—The Convolvulus Panduratus is a mild and very feeble cathartic, said by some to resemble Jalap, scammony, or rhubarb in its action, and to be used as substitute for those agents. It is, however, too feeble as a cathartic to permit such a comparison. It may be used as a gentle cathartic, or rather laxative, with some advantage. The root loses much of its medicinal activity by drying. The extract of the fresh root is said, by those who have used it, to be a very pleasant and effective agent.

It is also diuretic and pectoral. As a diuretic it is found useful in dropsy, calculous affections, in irritation of the urinary organs, strangury, etc. Dr. Harris, of New Jersey, found it beneficial in calculus of his own person. Others speak favorably of it in the same, and also in other diseases of the urinary organs. It is spoken of as a "pectoral" in coughs, colds, pains in the chest, asthma, consumption, etc. It may be administered in substance, extract, decoction, or syrup. In coughs it may be combined with skunk-cabbage.

LEPTANDRA.

THE ROOT OF LEPTANDRA VIRGINICA.—U. S.

PREPARATIONS.—Extract of Leptandra. Tincture of Leptandra. Leptandrin.

DOSE.—The dose of the extract will be from gr. j. to gr. v. Of a tincture, gtt. v. to gtt. x. Of Leptandrin, gr. ½ to gr. v.

THERAPEUTIC ACTION.— The Leptandra is a mild and pretty efficient cathartic, if administered in large doses; in smaller doses, a valuable aperient and tonic. It is exceedingly valuable in atonic states of the bowels. Whenever there is a weak and debilitated state of the general system, or when the bowels are enfeebled by repeated purgation, no article in the materia medica (if we except rhubarb) surpasses, if indeed equals, it as a cathartic. It is mild and unirritating in its action, and at the same time that it cleanses them it restores their tone.

As a cathartic, it is recommended during the early stages of dysentery as one of our most efficient agents. It removes the constipated state of the small intestines, acts specifically upon the liver, increasing its secretion, and gives tone to the entire alimentary canal. In dyspepsia, attended with a torpid state of the bowels, the Leptandra is an appropriate article. It is exceedingly valuable in these cases administered occasionally as a cathartic, and in the intervals in small doses as an aperient and tonic; it promotes the appetite and facilitates digestion. It is a very valuable addition to the vegetable bitters in such cases; when combined with them they will prove laxative without the use of other purgative medicine.

It is very useful during the forming stages of various types of fever; if administered at an early stage of the disease, in large doses, so as to purge briskly, it cleanses the stomach and bowels, restores the biliary secretion, and indeed promotes the secretions generally, thereby lessening the fever, and often arresting it. It is the principal cathartic upon which reliance is placed by certain "irregular physicians," in the treatment of febrile and inflammatory diseases. It is especially recommended in fevers of a typhoid type; also in the advanced stages of bilious, and during the convalescent stages of all forms of fever.

Some have spoken of it as almost a specific in dropsy. It seems to promote the secretions, thereby favoring absorption, and gives tone to the system. We have used it with marked advantage in some very obstinate cases of dropsy, particularly in hydrocephalus, combined with spearmint and cream of tartar, in such quantities as to produce ten or twelve watery stools in the course of twenty-four hours.

SENNA.

THE LEAVES OF CASSIA OFFICINALIS.—EGYPT.

Preparations.—The powdered leaves. Tincture of Senna.

Dose.—Of the powder, ʒss. to ʒij. Tincture of Senna in colic, gtt. j. to gtt. v.

Therapeutic Action.—Senna is a safe, prompt, and very efficient cathartic, and may be employed in all cases where an agent of this kind is required. It does not, however, act so efficiently on the secretions as many others, yet it produces copious alvine evacuations. It not unfrequently produces tormina, but this is readily counteracted by combining it with saccharine matter, as sugar, manna, etc.; or by the addition of bitartrate or bicarbonate of potash, or aromatics, as dill, fennel, peppermint, etc. The tendency which this agent has to irritate the gastro-intestinal mucous membrane, renders it objectionable in all cases where a predisposition to that state exists.

It is found to be beneficial in febrile and inflammatory diseases, but in these cases its beneficial effects are increased by combining it with more efficient hydragogues, as jalap, cream of tartar, etc. In bilious colic it often gives prompt and speedy relief, acting according to homœopaths upon the principle of *similia.* It is recommended in cases of apoplexy, hemiplegia, coma, etc., owing to the strong impression which it makes upon the intestinal nerves, arousing their sensibility and exerting a derivative influence.

The purgative powers of Senna are said to be augmented by combining it with bitters; authors generally concur in this statement.

The *Cassia Marylandica*, or American Senna, is sometimes employed as a substitute for the imported article. It acts only when administered in large doses, and then not very efficiently. It may be used when a gentle cathartic is required. Dose of the powder, ʒj. to ℥iij.

OLEUM RICINI.

THE EXPRESSED OIL OF THE SEEDS OF RICINUS COMMUNIS.—U. S.

Dose.—The oil may be given in doses of ʒss. to ℥j.

Therapeutic Action.—Castor oil is a mild, safe, and speedy cathartic. It rarely produces griping, or any irritation of the bowels, and when it operates it simply removes accumulations in them, without materially increasing the intestinal secretions. Its mild and unirritating qualities will readily point the practitioner of medicine to the class of diseases in which it will be found most important, and to the cure of which it seems to be most appropriate. It may be used in any case where a mild and unirritating, and not a revulsive and hydragogue cathartic is indicated.

The cases in which it seems most to be indicated are those in which there is gastro-intestinal irritation, or a debilitated state of the bowels, or general debility, as during the advanced stages of fever, during pregnancy and the puerperal state, in constipation where a simple evacuant is required, in cases where acrid agents have been taken into the stomach, or wherever acrid secretions or accumulations are present in the intestinal canal, and also in many diseases peculiar to children.

In mucous enteritis, castor oil is regarded as a most valuable agent; it is extensively employed in this disease, owing to its mild and unirritating character. It is often combined with the oil of turpentine and laudanum in dysentery, and used with much advantage. The castor oil and turpentine answer a very valuable purpose in typhoid fever attended with tympanitis; the same combination is also very useful in the tympanitis of puerperal peritonitis.

In constipation arising from hardened feces, castor oil lubricates the bowels, and causes their evacuation. It may be combined with harsh and acrid medicines to lessen their irritating properties.

It is considered a mild and useful cathartic for children, and when there is an irritable condition of the bowels, and a simple agent is required, perhaps there is no cathartic which answers a better purpose. It is combined with many anthelmintics, as worm-seed oil, to assist their action. Infants require relatively larger doses than adults. A peculiarity with regard to this agent as a cathartic is, that reduced quantities are required to produce purging after it has been frequently administered to a patient.

The seeds of the castor oil plant are powerfully cathartic and emetic. Two or three of them will purge, and seven or eight will act violently, producing emesis and hyper-catharsis.

As a means of disguising the taste of this article, the *Electuary of Septimus Piesse* will probably be found the most efficient. ℞ Castor Oil ℥iij., white soft soap ʒj., simple syrup ʒj., oil of cinnamon, gtt. vj. Rub the soap with the simple syrup in a mortar, and then add gradually the castor oil, with constant trituration, until it is thoroughly incorporated with the above ingredients. Finally, mix with the electuary thus formed, the oil of cinnamon, or any other essential oil that may be preferred. By this means a gelatinous electuary will be formed, which is rather palatable than otherwise, and nearly equals, bulk for bulk, castor oil in strength.

ALOES.

THE INSPISSATED JUICE OF THE LEAVES OF ALOE SPICATA.—SOCOTRA.

DOSE.—From the fraction of a grain to grs. v. or grs. x. Of a tincture, gtt. j. to gtt. xx.

THERAPEUTIC ACTION.—Aloes is cathartic, stimulant, tonic, stomachic, emmenagogue, and anthelmintic.

As a cathartic, it is slow to operate, owing to its action being principally upon the lower portions of the intestines. It does not act upon the intestinal mucous membrane, producing depletion, but mostly upon the muscular coat, stimulating it to increased activity, thus quickening the peristaltic action of the bowels, causing alvine evacuations. The discharges caused by taking aloes are not thin and watery. It seems also to augment the biliary secretion. In small doses it acts as a tonic, excitant and aperient; it promotes digestion, and gives tone to the stomach, and is therefore found useful in dyspepsia. As a tonic and stomachic, it is used with much advantage in general debility, attended with loss of appetite and a torpid state of the bowels. It quickens the circulation, and causes an increased warmth of body, clearly demonstrating its excitant powers.

From what has been said, it will readily be seen that aloes is not a suitable cathartic in habits that are of a sthenic character. If there should be any irritation of the bowels, its harshness would render it inadmissible; and should there exist a febrile or inflammatory habit, it would be too excitant and tonic, and not sufficiently depletive. But in torpid or debilitated states of the system, it is not only proper, but in many cases a highly important medicine. Accordingly it is recommended in chlorotic states of the system, scrofula, hypochondriasis, indigestion, habitual constipation, etc., combined with alkaline agents, as castile soap and aromatics, to counteract any irritating effects which it might produce.

Aloes is said to be possessed of emmenagogue properties, and as such is extensively employed in amenorrhœa. Whether it exerts any influence over the uterine secretion, by a direct action upon that viscus, is not determined; the probability is that it acts indirectly or sympathetically by producing a determination to the lower bowels and pelvis, thus producing or accelerating the menstrual flux. The strong influence of aloes manifested upon the rectum has caused it to be used for the removal of ascarides, or small worms, that have their habitat in this portion of the intestines.

A singular fact in relation to the modus operandi of this agent is, that small and large doses produce very nearly the same amount of purgation. It may be used in cerebral congestions as a derivative, but is not admissible in hemorrhoids, owing to its strong action upon the rectum, aggravating them when they exist, and often producing them; for the same reason it is not admissible in advanced pregnancy, or in menorrhagia.

SCAMMONIUM.

THE GUM RESIN OF CONVOLVULUS SCAMMONIUM.—SYRIA.

DOSE.—The dose of Scammony will vary from gr. j. to gr. x., according to the action desired.

THERAPEUTIC ACTION.—Scammony is very active, harsh and drastic, and for this reason the cases in which it is admissible as an independent cathartic, are by no means numerous. Its highly drastic properties would preclude the propriety of its employment in all cases where an irritation of the mucous membrane of the bowels exists. Its disagreeable taste also renders it an objectionable agent.

The Scammony may be combined with other active and equally harsh or drastic cathartics with advantage, their drastic action being modified and rendered comparatively mild by combining two or more of them together. So with this article, it may be added to other cathartics and aid in forming a purgative compound decidedly superior to either article alone.

It is appropriate in torpid states of the bowels, obstinate constipation, coma, apoplexy, cerebral congestions or inflammations, etc., cases in which a powerful derivative impression is desirable. It is sometimes employed as a vermifuge; it frequently destroys worms, and causes their evacuation, probably on account of the violence of its action.

GAMBOGIA.

A GUM-RESIN OBTAINED FROM GARCINIA HANBURII.—INDIA.

DOSE.—From one-half grain to five grains. It is better to give it in small doses, frequently repeated.

THERAPEUTIC ACTION.—Gamboge is one of our most powerful drastic, hydragogue cathartics; it often produces nausea and vomiting, violent tormina, and frequently irritation, or even dangerous inflammation of the gastro-intestinal mucous membrane. Its harsh and drastic properties may be lessened by combining it with other cathartics less harsh, and its beneficial effects still secured; or it may be united with demulcents which counteract the violence of its action, still securing its active operation upon the system. It should rarely or never be given alone as a cathartic, though it is extensively used variously combined, forming the base of many of the popular pills of the day.

The cases in which Gamboge is mostly used are, obstinate constipation of the bowels, hepatic torpor, dropsy, coma, phrenitis, apoplexy, cerebral congestions, etc., whenever a strong revulsive impression is desirable. The remarks made upon Colocynth in the same or similar cases, are applicable to Gamboge, though this is still more efficient than that agent. In torpor of the liver it may be combined with Sanguinaria and Podophyllin with great advantage; the compound extract of Colocynth is also a valuable addition. These articles made into pills, qualified by the addition of aromatics and stimulants, will be found very useful in all cases where active cathartics are desirable, and where a deobstruant is indicated.

COLOCYNTHIS.

THE FRUIT OF CITRULLUS COLOCYNTHIS.—JAPAN, SPAIN.

PREPARATIONS.—Tincture of Colocynth. Extract of Colocynth.

DOSE.—For its specific use the dose is very small. ℞ Tinc. Colocynth gtt. j. to gtt. v., water ℥iv.; a teaspoonful every hour or two. Of the crude article or of the extract, as a cathartic, grs. v. to grs. x.

THERAPEUTIC ACTION.— Colocynth, when administered incautiously, acts violently upon the bowels, and in some cases produces dangerous and even fatal inflammation of the bowels. It is justly termed a powerful drastic hydragogue cathartic. From the violence of its action it sometimes causes tormina, inflammation of the mucous membrane, and bloody discharges. It sometimes produces nausea, vomiting, and long-continued hypercatharsis.

It will readily be seen from what has already been said, respecting the action of this agent, that it would be highly improper to administer it in the advanced stages of most diseases, or in any case of great debility; as also in all cases attended with or predisposed to irritation or inflammation of the bowels.

As a powerful deobstruent and hydragogue cathartic, it is recommended in the early stages of fevers, and in dropsy, particularly in passive dropsies, or those arising from visceral obstructions; it removes large quantities of serum, and is therefore powerfully depletive; and an additional reason for its use in dropsies is its supposed diuretic powers. It is also employed in torpor of the liver, and obstinate constipation, though we have more effectual agents. It is also used in amenorrhœa : as a deobstruent in this case it often proves beneficial. In cerebral congestion or inflammation, in apoplexy or coma, when a very powerful derivative influence is desirable, this agent constitutes one of our most efficient cathartics; it is also highly recommended in paralysis, especially in paraplegia. Though extremely harsh and drastic in its action, yet if properly qualified by combining it with other cathartics, or if united with demulcents and aromatics, it is rendered mild and perfectly safe, and constitutes one of our most valuable purgatives.

SPECIFIC INDICATIONS.—Pains resembling colic in the iliac and hypogastric region ; tensive rheumatic pain, with muscular contractions; painful diarrhœa with tenesmus and mucoid discharges ; dysenteric evacuations with pain resembling colic.

SPECIFIC USES.—Following the indications as above, we find a most important field for this remedy. In colic affecting the lower abdomen, and especially if there is a desire for stool, there is no more certain remedy than Colocynth. In dysentery where the pain is in the right iliac region, or when the dysenteric tormina involves the entire abdomen, Colocynth may be administered. Persistent diarrhœa with tormina and mucoid discharges calls for Colocynth.

It is also a valuable remedy in rheumatism, in lumbago and sciatica, and in some cases of neuralgia. The reader will be governed by the indications as named, in these cases.

ELATERIUM.

DEPOSIT FROM THE JUICE OF MOMORDICA ELATERIUM.—GREECE.

DOSE.—The dose of Elaterium runs from one-tenth to one-fourth grain.

THERAPEUTIC ACTION.—Elaterium is a drastic hydragogue cathartic, and said to be diuretic. As a powerful hydragogue cathartic, in minute doses, this article is unequaled by any other agent in the materia medica. If too freely employed, the violence of its action admonishes the physician of the necessity of prescribing it cautiously, not always, however, until it is too late to repair the injury. If administered in large doses it causes excessive nausea and vomiting, irritation of the mucous membrane, or even an inflammation that may prove fatal. The violence of its action and the high price of the article, probably prevent the frequent and too free use of this agent.

Cautiously administered, Elaterium may be used with great propriety in cases where we wish to produce a powerful derivative and depletive effect upon the system; particularly when the patient is of a plethoric habit, and has a strong and vigorous constitution. In debilitated states of the system it is inadmissible, as well as when there is any irritation of the intestinal mucous membrane.

It is principally used in the treatment of dropsy, to which it appears to be especially adapted, often proving successful in the most obstinate cases, and after a variety of other measures have proven abortive. It has proved a highly important hydragogue, promoting absorption, and at the same time lessening effusion by diverting the increased vital action from the point of effusion to the intestinal mucous membrane.

RHAMNUS.

THE BARK OF RHAMNUS CATHARTICUS, R. FRANGULA, R. CAROLINIANUS, R. PURSHIANA.—U. S.

Preparation.—A tincture of the recent bark.

Dose.—The dose of Rhamnus will vary from gtt. x. to ʒj., according to the action desired.

Therapeutic Action.—All the species of Rhamnus are cathartic, differing only in their activity. In the olden time, only the berries of the Rhamnus Catharticus were employed; but from their activity and the danger of gastro-intestinal irritation, they were but little used. Still, I am satisfied that in proper dilution and in small dose, the tincture of the seed would prove quite as good as the so much advertised *Cascara Sagrada*. The bark is much milder, and may be employed for the ordinary purposes of a cathartic.

The *Rhamnus Purshiana*, the species obtained on our western coast, has recently been quite extensively employed, and is a fairly good remedy if used with care. It is extremely nasty, and few persons will care to take it in preference to more pleasant drugs. Still it has this virtue, that there is less danger of constipation following its action, and in some cases it may break up habitual constipation.

The *Rhamnus Carolinensis*, our southern species, is now being used in place of the Purshiana, and it is said with equally good results.

OLEUM TIGLII.

THE EXPRESSED OIL OF THE SEEDS OF CROTON TIGLIUM.—East Indies.

Dose.—Croton oil is administered in doses of one or two drops; in cases of coma and where there is great torpor or insensibility, from five to ten drops will produce but a feeble impression upon the patient. It is better to administer it in pill or emulsion, and half a drop at a dose, repeated sufficiently often to obtain its effects.

Therapeutic Action.—Croton oil is a speedy and powerful hydragogue cathartic. If we except elaterium, it is more energetic, and produces more effect upon the system in minute doses than any other cathartic agent. The activity of the oil, the certainty and efficacy with which it acts, and the smallness of the dose required to produce these powerful impressions upon the system, together with the facility with which it may be taken, and the comparative mildness of its action, render it an agent worthy of notice. It may, however, be so administered as to produce vomiting, hypercatharsis, violent tormina, gastro intestinal irritation or inflammation, or even fatal results.

It is evident that an agent of such powers should be administered cautiously, and so combined with demulcents and aromatics, and so timed, as to render its operation as mild as possible. If administered in cases of great debility, it should be so combined with demulcents and stimulants as to prevent its irritant and exhausting effects. It acts rapidly, often in one hour, and frequently produces a disagreeable burning in the fauces and throat.

In cases of mania or furious delirium, the facility with which it can be administered gives it a superiority over all other cathartics. If the patient will not take medicine, he may be deceived by giving the oil in wine, milk, etc., and thus its full advantages are secured. In spasm of the glottis, epilepsy, and neuralgia, it is supposed to prove valuable, independent of its purgative property.

The seeds have been used in India for their cathartic powers, in doses of one or two grains; they are not used in this country. Four drops of the oil, applied to the umbilicus, often purges.

Applied externally it acts as a suppurant revellant, producing rubefaction, and finally vesicular and pustular eruptions, and proves a valuable derivative. It has been employed for this purpose in chronic bronchial affections, phthisis, chronic laryngitis, rheumatism, neuralgia, glandular enlargement, spinal diseases, etc.; it is sometimes used in its pure state, but more frequently diluted with olive oil, turpentine, alcohol, etc.

COLCHICUM.

THE BULB OF COLCHICUM AUTUMNALE.—EUROPE.

PREPARATIONS.—Tincure of Colchicum. Wine of Colchicum.

DOSE.—The dose of either of these preparations will vary from one to thirty drops.

THERAPEUTIC ACTION.—Colchicum is cathartic, emetic, diaphoretic, diuretic, expectorant, sedative, anodyne, and acronarcotic. In small doses it promotes the secretions, especially that from the mucous membrane of the bowels. If the doses are larger, nausea, vomiting and purging, with a reduction of the pulse, are the ordinary effects; a sense of debility with headache, also follows its use. These effects are not invariable, and not dependent upon the degree of purgation; copious perspiration, increasing the biliary secretion, or an augmented flow of urine, are common effects following its use; salivation sometimes results. In gout and rheumatism, it is said in some cases to strikingly increase the amount of uric acid in the urine. In over-doses it acts as a violent poison, causing severe pain in the bowels, vomiting, acute tenesmus, small, slow and feeble pulse, cold feet, and weakness of the limbs.

The colchicum is a peculiar and very interesting remedial agent. Its peculiarity arises from the number of properties which it possesses, and from the diversity of impressions which it makes upon the system. Operating as it does, sometimes violently as a hydragogue cathartic, perhaps as an emetic; sometimes as a diaphoretic or diuretic, at others as an expectorant; now as a stimulant to all the secretions, then upon one secretion only, or upon a part of them; and again, as a sedative, diminishing the momentum of the circulation, while at another time it acts in small doses as an anodyne, lessening the nervous sensibility.

In large doses it almost invariably produces purging, attended with nausea and vomiting, a burning sensation in the stomach, tenesmus, and sometimes strangury.

Colchicum has been regarded as a specific curative agent, in the treatment of *gout*, but at this time it is considered merely as giving temporary relief. The similarity existing between gouty and rheumatic affections, suggested the employment of this agent in the latter disease, also. But the high estimate placed upon it in gout as a curative agent, is not fully realized in the treatment of rheumatism. As a hydragogue cathartic and depletive agent, as a sedative and anodyne, and as a diuretic and diaphoretic, it can not fail, as a general rule, to lessen the pain and inflammatory excitement, and thus prove a valuable palliative, if not a curative agent.

In other painful inflammatory diseases, it reduces the pulse, renders it softer, and allays the general irritation and pain. It also stimulates the intestinal exhalants, and causes copious watery stools. "The influence which it exerts over the pulse, supersedes the use of the lancet," say those who deplete with that instrument. "Its most frequent operation," says a distinguished author, "I believe when fairly tried, has been to allay pain, reduce the pulse, and diminish symptomatic fever."

HELLEBORUS.

THE ROOT OF HELLEBORUS NIGER.—EUROPE.

PREPARATIONS.—The powdered root. Tincture of Hellebore.

DOSE.—Of the powder, from grs. j. to grs. xx. Of the tincture, gtt. j. to gtt. x.

THERAPEUTIC ACTION.—The black hellebore is cathartic, emetic, emmenagogue, and in over doses acro-narcotic. In its recent state it is a very drastic, hydragogue cathartic. That met with in the shops in this country, is not so active and powerful as when first dug, owing to loss of strength, by long keeping. If it is taken in over-dose, it may cause hyperemesis and hypercatharsis, and dangerous gastro-intestinal inflammation, terminating in vertigo, cramp, burning pain in the stomach, cold sweat, paralysis, violent convulsions, and even death. There can be no doubt of its acro-narcotic properties.

It was employed by the ancients mostly in diseases of the nervous system, as in mania, epilepsy, melancholia, etc., and often it is said with great success. It is supposed to have given relief by virtue of its powerful derivative action. It was also employed as an alterative, in some inveterate cutaneous diseases, and as a hydragogue cathartic in dropsy. At the present time it is not often used in any of these affections, though occasionally employed in chronic rheumatism with gum guaiacum, and other agents valuable in that disease.

It is mostly used at the present time as an emmenagogue. Whether it acts specifically on the uterus, is a question not yet decided; the major part of the profession incline to the negative, believing that the uterus in case of its administration, is indirectly and sympathetically acted upon, through the bowels.

IRIS.

THE ROOT OF IRIS VERSICOLOR.—U. S.

Preparation.—Tincture of Iris.

Dose.—The dose of Iris will vary from the fraction of a drop to ʒss. For its specific use I add gtt. x. to gtt. xx., water ℥iv.; dose one teaspoonful.

Therapeutic Action.—The Iris is cathartic, emetic, diuretic, alterative, sialagogue, stimulant and astringent. As a cathartic, the recent root is active, and has been much used, especially in the South. Dr. Bigelow found it efficacious as a purgative, but the distressing nausea and prostration attending its operation, render it very unpleasant, unless combined with other agents to modify its action. Dr. Smith generally made use of the powder, giving it in twenty-grain doses, repeating if necessary. He reports its operation as powerful, certain and quick, sometimes taking effect in half an hour; he has also seen it move the bowels when Jalap, Gamboge, and other strong purgatives, had no effect; he also used it alone in cases of tape-worm with success. Thacker states that the expressed juice of the recent root, given in quantities of sixty or eighty drops every hour or two, and occasionally increased, has produced copious evacuations after Jalap, Gamboge, and other strong purgatives had proved ineffectual.

The Iris is an important alterative, and its superior value for this purpose is far from being duly appreciated by the great body of the medical profession. In chronic hepatic affections, cachectic states of the system, mercurial cachexy, disordered states of the glandular system, syphiloid affections, etc., it is a favorite remedy. In the secondary or tertiary form of syphilis, after mercury in all its forms of administration had proven abortive, this agent has restored patients to perfect health.

Specific Indications.—Fullness of the thyroid gland is probably the most direct indication. Enlargement of the spleen, enlargement of the lymphatic glands, they being soft and yielding to pressure, are indications.

Specific Uses.—It is the most certain remedy we have for enlargement of the thyroid, goitre, exophthalmia, and fullness of the thyroid body associated with wrong of menstruation. It is also a very valuable remedy in chronic disease of the pancreas with sodden lead colored tongue, and in scrofula and syphilis, with the condition of lymphatic glands named above.

MANNA.

AN EXUDATION FROM ORNUS EUROPEA.—EUROPE.

DOSE.—Of Manna for an adult, from ℥j. to ℥ij., dissolved in aromatic water; for children, ʒj. to ʒiv., in warm milk.

THERAPEUTIC ACTION.—Manna is a gentle laxative, sometimes causing flatulence and pain, and not used when active purgatives are indicated. It is adapted to persons of delicate habit, to debilitated states of the system, and when we do not wish to act on the glandular system, or promote the secretions. It is suitable for females during pregnancy, and in the puerperal state if active purging is deemed improper; it may also be administered in hemorrhoids, in cases of constipation, and in the treatment of various diseases of children. It is mild and pleasant, and in these respects it is preferable to many other agents of this class.

TRIOSTEUM.

THE BARK OF THE ROOT OF TRIOSTEUM PERFOLIATUM.—U. S.

PREPARATIONS.—The powdered bark. Tincture of Triosteum.

DOSE.—The dose of the powdered root, as a cathartic, grs. xx. to ʒss. Of the tincture, gtt. x. to xx.

THERAPEUTIC ACTION.—The Triosteum is cathartic, emetic, tonic, diuretic, anti-rheumatic, and alterative. When administered in suitable doses, it acts pretty efficiently as a cathartic; in larger doses, as an emetic; in smaller doses, it is tonic and diuretic.

As a cathartic it is sometimes prescribed in the early stages of intermittent and remittent fevers, but it is not sufficiently active to command any particular attention in these diseases. It may be combined with the podophyllin or jalap in these cases, and answers a very good purpose. It may be used in atonic states of the system as a cathartic, as a laxative, or tonic, as it is not debilitating like most cathartics. The Triosteum is spoken of as a diuretic, but rarely used for this purpose.

PRUNA.

THE POWDERED FRUIT OF PRUNUS DOMESTICA.—Europe.

Therapeutic Action.—Prunes are laxative and nutritious. Boiled in water they constitute a pleasant laxative diet, and as such may be used in habitual torpor of the bowels, and during the convalescent stage of fevers. The saccharine and mucilaginous matters which they contain render them nutritious. If too freely employed in debilitated states of the system, they not unfrequently occasion flatulence, pain in the bowels, and moderate diarrhœa.

CASSIA.

THE PULP OF THE FRUIT OF CASSIA FISTULA.—East Indies.

Dose.—As a laxative it may be administered in doses of ʒj. to ʒij ; as a cathartic, ℥j. to ℥ij.

Therapeutic Action.—Cassia pulp is laxative in small doses, and purgative in large. It often causes nausea, flatulence, and griping. Rarely administered alone, but mostly combined with other and less pleasant cathartic agents. Its pleasant taste renders it a convenient cathartic for children.

MANGANESII SULPHAS.

Dose.—The dose of sulphate of manganese in works on materia medica (grs. x. to grs. xv.), is very much too large, and will cause irritation of the stomach and intestinal canal. In my practice I have found grain doses to give the best results, sometimes lessening them to one-half grain, and sometimes increasing to three grains.

Specific Indications.—The dropsy that follows long continued use of liquor; dropsy with a full pulse, and sense of oppression in epigastrium, with oppressed breathing, and inability to lie down.

Therapeutic Action.—"In experiments upon animals, when given in large doses it causes vomiting and gastro-intestinal inflammation; injected into the veins it causes vomiting and purging, dyspnœa, rapid exhaustion, paralysis, and death." In doses of grs. v. to grs. x. it produces catharsis and not unfrequently increased secretion of bile. Yet I think it should never be employed to obtain its cathartic action, because of the danger of gastro-intestinal irritation and inflammation, the small dose answering every purpose.

When first used in medicine it was thought to belong to the class "hematics," or blood makers, having a similar action to iron. This opinion, however, has not been sustained, and in consequence the remedy has fallen into disuse. I believe, however, that the failure to obtain good results was due to the large dose employed, and that when the small dose is used it will be found to favor blood-making.

I employ the sulphate of manganese in the treatment of dropsy with most excellent results. Sometimes I use it to supplement the apocynum, and sometimes alone. In ascites, if the dropsical accumulation is large, the water should be drawn off with a trocar, and then the remedy given.

I have tried it to a limited extent in hepatic engorgement with tumid abdomen, and if the cases are properly selected, I think it will prove a valuable remedy. It is in these cases—enlargement of the liver and spleen, tumid and pendulous abdomen, and torpor of the digestive and blood-making organs—that it exerts its influence in improving blood-making.

MAGNESIA CARBONAS.

DOSE.—Of Carbonate of Magnesia as an aperient, ʒss. to ʒij.; as an antacid or antilithic, from grs. x. to grs. xxx.

THERAPEUTIC ACTION.—Carbonate of Magnesia is laxative and antacid, but more properly the latter, since its laxative effect does not follow unless there be acid in the stomach. To secure its laxative effect it is necessary to follow it with acids, as lemonade, etc. Some objection arises to the use of this agent from the flatulence which it sometimes produces; for this reason the calcined magnesia is preferred in cardialgia, or where an antidote is required to the mineral acids. It is frequently employed in acidity of the stomach and bowels, as in diarrhea and dysentery, cardialgia, sick headache arising from the presence of acid in the stomach, in heartburn, and in the nausea and vomiting attendant on pregnancy. It is also prescribed as an antilithic in cases where a redundancy of lithic acid is secreted.

MAGNESIA.

Dose.—Of Magnesia, as a laxative, ʒss. to ʒj.; as an antacid or antilithic, gr. x. to ʒss. It should be thoroughly triturated and intimately mixed with milk or sweetened water before it is administered.

Therapeutic Action.—Magnesia *Calcinata*, or *Usta*, is a mild laxative and antacid, and as such it often proves valuable in diseases of children. In diarrhœa and dysentery arising from a redundancy of acid in the primæ viæ it is valuable, especially when united with rhubarb. In flatulence it may be combined with carminatives, as dill or anise water. It is sometimes added to the more drastic cathartics, to modify the severity of their action.

In dyspepsia and cardialgia, arising from the presence of an acid in the stomach, attended with constipation, the Calcined Magnesia is often prescribed with decided advantage. It is an important anti-emetic in sympathetic vomiting, especially in those cases arising from pregnancy; in this case it should be given till it acts as a gentle laxative. Also employed by adults in diseases of the rectum, as piles, stricture, etc. It is also used in gout, rheumatism, sick-headache, and whenever there is a redundance of uric acid secreted, giving rise to the formation of urinary calculi.

MAGNESIA SULPHAS.

Dose.—The ordinary dose of this agent as a cathartic is ℥j. It may be conveniently administered in soda water, with lemon syrup. It is sometimes employed in combination with sulphuric acid, as—℞ Aqueous solution of sulphate of magnesia ℥viij., dilute sulphuric acid ʒj.; a tablespoonful in a wineglass of water.

Therapeutic Action.—Sulphate of Magnesia is cathartic, refrigerant and diuretic, possessing the characteristics of most of the saline cathartics. It is considered a mild, safe, refrigerant and hydragogue cathartic. Although nauseous and unpleasant to the taste, it is more acceptable to the stomach than many less unpleasant articles. It acts upon the whole extent of the intestinal canal, producing numerous and copious watery evacuations. Often combined with other cathartics to modify their effects.

POTASSÆ BITARTRAS.

Dose.—Of Bitartrate of Potash as a hydragogue cathartic, ʒiv. to ʒvj.; as a diuretic and refrigerant, gr. xx. to xl.

Therapeutic Action.—Bitartrate of Potash is cathartic, diuretic and refrigerant. It may be considered one of the best, if not the best, of the purgative salts, and is probably more frequently employed than any other, on account of its taste being much less unpleasant than many others. It is used in febrile and inflammatory diseases, as a mild and cooling purgative, producing free watery evacuations from the bowels.

SODÆ ET POTASSÆ TARTRAS.

Dose.—Of the Tartrate of Soda and Potash, as a purge, ℥j. to ℥iss.

Therapeutic Action.—Tartarized Soda is a mild and refrigerant cathartic, and one of the most acceptable of the neutral salts. It seems well adapted to weakened and irritable states of the stomach, being very rarely rejected. It is frequently administered as an aperient to females and delicate persons. It is useful in cases attended with excessive secretion of uric acid or the urates, while it is to be avoided in those cases in which the phosphates are deposited, for it undergoes a partial decomposition in the system, and in this case assists to form the urinary deposit.

It is often administered as an effervescing draught in the form of the *Seidlitz Powders*, which consist of ʒij. of this salt and ℈ij. of bicarbonate of soda, put up in a white paper, and tartaric acid grs. xxxv. put up in a blue paper. These powders are to be dissolved in separate portions of water, when they are to be added together, and taken while in a state of effervescence.

SODÆ SULPHAS.

Dose.—As a cathartic this salt may be given in doses of ℥ss. to ℥j.; as an aperient and diuretic, ʒj. to ʒiv. It may be so combined with lemon juice, cream of tartar, dilute sulphuric acid, etc., as to disguise its unpleasant taste, and render it palatable.

Therapeutic Action.—Sulphate of soda in large doses is cathartic, in smaller doses aperient and diuretic. Because of its unpleasant taste it is rarely prescribed now, the sulphate of magnesia having taken its place in the class of saline cathartics. In large doses it is a mild and efficient cathartic, and by reason of its refrigerant properties, is well adapted to febrile and inflammatory diseases. If administered in small doses, largely diluted, it acts as an aperient and diuretic. It produces a copious exhalation from the mucous membrane of the intestinal canal without producing irritation. It may be administered in the same diseases in which epsom salts are used, as fever, inflammation, colica pictonum, etc.

White Liquid Physic.—℞ Sulphate of soda ℔ss., water Oiss.; dissolve the sulphate of soda in the water, and add nitric acid ℥j., hydrochloric acid ℥j.

This forms one of our most efficient preparations in the treatment of dysentery. We administer it in this disease in doses of a tablespoonful, in sufficient sweetened water to make it palatable, every hour, until it produces at least one free bilious evacuation from the bowels, and then continue it in smaller doses to keep up its effect. It acts directly upon the liver, removes the constipated condition of the upper part of the intestinal canal, lessens the tormina and tenesmus, and speedily checks the dysenteric discharge. In some instances we have known it to remove all the dysenteric symptoms without producing catharsis, but this is somewhat rare. The only objection that can be raised to its employment is its disagreeable taste, which is overbalanced by the benefit derived from its use.

SODÆ PHOSPHAS.

Dose.—Of this salt the dose is from one to two ounces.

Therapeutic Action.—Phosphate of soda is a mild laxative, and, owing to its pleasant taste, is readily administered. It is analogous to other saline cathartics in its properties. It is said to be well adapted to weak and delicate stomachs, and particularly to children, and to have been useful in restoring to the blood the saline principle which it had lost in cholera.

SULPHUR SUBLIMATUM.

Dose.—As a laxative, the dose of sulphur is ʒj. to ʒiij. ; as an alterative, excitant and diaphoretic, ʒss. It may be administered in molasses, syrup, or honey, in the form of an electuary, or in milk or spirits.

Therapeutic Action.—Sulphur is laxative, diaphoretic, stimulant and alterative. In large doses it acts mildly as a laxative, and as such is prescribed with advantage in diseases of the rectum, as hemorrhoids, stricture, prolapsus, etc. In order to render it more active, it is often combined with bitartrate of potash or magnesia, and then forms a very pleasant cathartic in pregnancy.

It is a popular remedy in many cutaneous diseases, particularly scabies, or *itch*; in prurigo, impetigo, and other diseases of a similar nature, it often proves valuable. In chronic catarrhs, asthma, and other chronic pulmonary diseases, it may occasionally be employed with advantage.

In small doses sulphur acts as a gentle stimulant to the organs of secretion, particularly the cutaneous, renal and pulmonary, and serves to promote them by increasing the capillary circulation in these organs. It frequently proves valuable as an alterative in constitutional taints of the system, as scrofula, secondary syphilis, glandular enlargements, rheumatic and gouty affections, mercurial rheumatism, etc., together with the long list of cutaneous diseases.

It is not only valuable as an internal medicine, but also as an external application in the form of an ointment, or of the sulphurous acid gas, as a bath, the head being protected from its effects. In these forms it is mostly employed in cutaneous diseases, particularly in scabies.

CLASS III.

DIAPHORETICS.

Diaphoretics are a class of remedial agents which augment cutaneous transudation; if they produce copious perspiration, they are called *sudorifics;* if they but increase the insensible transpiration, they are called *diaphoretics;* the action of the two classes are the same, the degree of influence upon the cutaneous exhalants constituting the only difference.

The function of cutaneous transpiration is one of great importance to the welfare of the animal economy, so much so, indeed, that when it has been entirely arrested death ensues.

To appreciate the importance of this secretion, we have only to consider the extent of the excretory apparatus of the skin, and the amount and character of the matters excreted. In regard to the extent of this apparatus, Erasmus Wilson says: "I counted the perspiratory pores in the palm of the hand, and found 3,528 in a square inch; now each of these pores being the aperture of a little tube, about a quarter of an inch long, it follows that in a square inch of skin on the palm of the hand, there exists a length of tube equal to 882 inches, or 73.5 feet. Surely such an amount of *drainage* as 73 feet in every square inch of skin, assuming this to be the average of the whole body, is something wonderful, and the thought naturally intrudes itself,—'What if this *drainage* were obstructed?' The number of square inches of surface in a man of ordinary hight and bulk, is about 2,500; the number of pores therefore, is 700,000, and the number of inches of perspiratory tube, 1,750,000, that is, 145,833 feet, or 48,600 yards, or nearly 28 miles."

It has been estimated by Seguin, from careful observations, that eleven grains of matter are excreted from the skin per minute, being equal to thirty-three ounces in twenty-four hours. This consists of—

Organic matter,	107.47	grains.
Saline matter,	81.92	"
Water and volatile matter,	15,650.61	"

The maintenance of the normal condition of this very extensive and highly sensitive tissue, is of primary importance in the preservation of health. This is satisfactorily proven by the morbid conditions so frequently and so speedily induced by the suppression of perspiration, or by derangement of its normal function. When we take into consideration the extent of the cutaneous tissue, the innumerable sudoriferous glands, the ducts of which penetrate it and empty upon its surface, through which much of the effete matters of the system should escape, and through which they do escape, in a state of health, we can not be insensible to the important office which it performs. We can also readily understand the extensive influence which it is capable of exerting upon the whole system if its normal functions are destroyed, and also to the very salutary and extensive influence which may be exerted upon it, and through it upon the entire system, in subverting morbid action in disease.

There are four great emunctories through which all the decayed or decaying materials generated in the system by the processes of disintegration, and which can be no longer subservient to the purposes of the animal economy,—but which if retained, must act as sources of disease, causing fever, irritation, inflammation, etc.,—are excreted. Through these emunctories, the bowels, kidneys, lungs and skin, these obnoxious materials must pass off. Now if any of these excretory organs fail to perform their function, and elimination does not take place, the retained excrementitious materials must become irritants, and if long retained, they will not only vitiate the blood by their presence, but they will communicate the same process of decay to the blood, and hence some variety of fever or inflammation will be the result.

From these remarks relative to the excretions in general, and from the important functions which the skin is destined to perform, the following deductions may be drawn: First, we infer from the great amount of effete material thrown off in this way by this extensive excreting surface, that any cause that may arrest or diminish its normal action, and cause a retention of them, will be a cause of general disease, showing itself in some of the numerous forms of fever; or if some particular organ or tissue be predisposed to take on a diseased action, we may witness a local disease, or one in which the intensity of the excitement is concentrated upon a certain part, while other parts are but sympathetically affected.

"Health," says Dr. Eberle, "is very intimately connected with the regular performance of the perspiratory functions. Whenever the transpiration by the skin is suddenly checked, more or less derangement of the system is invariably the consequence." He further observes, "That portion of the circulating fluid which nature designs to be cast off by the cutaneous emunctories, as no longer fit for the purposes of the animal economy, is retained, and becomes a source of morbific irritation to the heart and other organs." We may also infer from its functions, and from the sympathetic relations which it bears to the glandular, lymphatic, mucous, serous and nervous systems, exalting, modifying or arresting their functions according to its own normal or abnormal condition, that it is an important tissue to act upon, and through which to counteract diseased action, whether excessive or diminished.

Experience has fully convinced us that suppression of the perspiration is a very fruitful source of disease. It is true that this suppression is often counterbalanced by some other emunctory taking upon itself a vicarious action, thus supplying the place of the one whose functions are impaired. We are also quite as well convinced that the restoration of this function is of infinite importance, and that those agents which restore it, whether they act directly or indirectly, are therapeutic agents of the first importance.

The views that we have above expressed relative to the utility of this class of remedies, and the importance of restoring this secretion in numerous diseases, are corroborated by many of our most distinguished authors, as Drs. Wood, Eberle, Thompson, Paris, etc.

In opposition to these views, we present those of Dr. Dunglison. He says: "It may admit, however, of well-founded doubt, whether disease be ever induced by suppression of the cutaneous exhalation." He supposes that cold, operating upon a limited part of the surface of our bodies, morbidly impresses the cutaneous capillaries of that part, and that the local or general disease is sympathetic, or that the internal capillary system sympathizes with the morbid condition of the external capillaries. He says: "This irregular action of the capillaries of the part is the first link in the chain of phenomena, not the obstruction of perspiration." We readily admit that the first morbid impression from cold thus applied, is made upon the superficial capillaries; but this impression consists in a spasm of the minute vessels; the sudoriferous glands do not receive a supply of blood, and their excretory ducts are closed. There is a general cutaneous paralysis, and thus the excrementitious materials thrown into the capillaries to be eliminated, are retained; they accumulate, render the blood irritating, and produce fever, inflammations, etc. If, as Dr. Dunglison contends, the *irregular action* of the capillaries constitutes the *first link* in the chain of morbid phenomena, the superior efficacy of diaphoretics would be none the less important in breaking that "*link*"; for no influence which can be brought to bear upon the system when it is in a state of disease, so effectually subverts capillary excitement as diaphoretics. Yet, strange as it may seem, Dr. Dunglison still further remarks that, "In any mode, consequently, of viewing the subject, it does not appear that we can ascribe any extensive series of morbid phenomena to simple suppression of perspiration. Such being the fact, the indication of restoring suppressed perspiration—if it be admitted at all—must exist much less frequently than has been imagined. He further observes that but few classes are more frequently used, "and probably none which are more uncertain in their operation, and on which less reliance ought to be placed." Again he remarks "Perhaps we have no class of remedies more uncertain in their operation than anatomical diaphoretics, as ordinarily administered. It might indeed be said that there are no agents so devoid of any beneficial action." He finally sums up the matter in such a way that we can not fail to see the little importance which he attaches to this class of remedial agents. He says: "On the whole, then, even in febrile and inflammatory affections, the use of the ordinary internal diaphoretics is uncertain, and generally of no avail."

These views of this distinguished compiler we conceive to be eminently erroneous; instead of diaphoretics being "*of no avail*" in febrile and inflammatory diseases, and instead of the indication of restoring suppressed or diminished perspiration rarely existing, their employment in the cases referred to should constitute one of the cardinal measures in the treatment of such cases, and the restoration of the cutaneous transpiration is to be regarded as an indication of paramount importance. It is true many of the diaphoretic agents act indirectly upon the cutaneous capillaries, removing the spasm, and augmenting the secretions; yet their importance as curative agents, and the necessity of restoring or promoting that secretion is none the less imperative.

Action of Diaphoretics.—Diaphoretics may be divided into two classes, according to their mode of action: the first of these classes act directly upon the glands of the skin, and hence we name them *specific diaphoretics;* the second class produce diaphoresis indirectly, and on account of some other property possessed by them: these may be named *indirect diaphoretics.*

Specific diaphoretics stimulate the sudoriferous glands to increased action, and thus increase the secretion. We suppose that they act in the same manner as specific diuretics or cathartics; they have an affinity for this secreting structure, pass to it, and are eliminated by it; and in this manner stimulate it to increased action. Volatile diaphoretics belong to this class, as also ammonia and its various salts, and some acrid agents, as guiacum, senega, etc. The best example of this class is probably the asclepias tuberosa, or its active principle, asclepin. These agents are not always certain in their action, owing to the peculiar state of the system, or the different hygrometric states of the surrounding air. But as they act directly from the blood upon the secreting apparatus, if this is in a condition to be impressed by stimulus, these agents act as direct diaphoretics.

Indirect diaphoretics may act by *relaxing the cutaneous tissues*, or by *determining the circulation to it.* The effect of remedies which relax the system, in the production of diaphoresis, may be accounted for by the relaxed state of the capillary vessels of the skin, and the readiness with which the watery portions of the blood will pass through their coats in this condition, and also by the relaxation of the tissues surrounding the sudoriferous glands and ducts, whereby they are enabled to freely receive and throw their secretion upon the surface. This condition of the cutaneous surface is produced by emetics and nauseants; we also notice it in the relaxation which follows fever, and in the night-sweats of debilitating or exhausting diseases.

Determination of blood to the skin is an important part of diaphoresis; any thing that will determine to the surface will increase the secretion, providing the cutaneous tissue is relaxed. Thus, in fever we have an increased circulation and determination to the surface, but the skin is constricted, hot and dry, and the walls of the capillaries tense and rigid; hence it is impossible for transudation to take place. But if the temperature and pulse are reduced by sedatives, we then have all the conditions present (if the body is kept warm) for the production of *indirect* diaphoresis.

The action of all diaphoretics is promoted by cleansing the skin, keeping the body warm, and by the free exhibition of warm diluents. Diaphoresis may be produced, simply by bathing the feet in warm water and keeping the body warm. The warm water relaxes the skin, and the heat determines to the surface.

The wet-sheet pack acts in a similar manner. Its first effects are indeed the opposite of diaphoresis; but when reaction takes place, the circulation is determined to the surface, which is relaxed by being in contact with the water.

Lastly, if the skin is kept cool, diaphoresis is prevented; that which would have been eliminated by the skin passes off by the kidneys. Thus, if we wish to produce diaphoresis, the skin should be kept warm, and the fluids taken should also be warm; while, if we wish to produce diuresis, we administer the remedy or diluents cool, and also keep the skin cool.

THERAPEUTIC INDICATIONS.

Very different diaphoretics are demanded in different states of the system. If obstructed perspiration depends upon an exalted vital action, as in fever, *nauseants*, *refrigerants*, *sedatives*, *ablutions* (either tepid or cold), aided by any of the warm diaphoretic infusions, or even cold acidulated drinks, as iced water, lemonade, etc., will diminish the momentum of the circulation, lessen the vascular tonicity, and favor not only the restoration of the cutaneous transpiration, but other organs may be excited to resume their functions also. These agents act as sedatives, and indirectly as diaphoretics; they diminish morbid excitement throughout the vascular system, and particularly in the capillaries, and promote the secretions. A combination of properties as sedative, refrigerant, anodyne, nauseant, expectorant, diuretic, diaphoretic, etc., frequently adds much to their medicinal virtues; a combination of diaphoretics is always better than single articles.

Obstructed perspiration may depend upon a slow and languid circulation, in which case the skin will be shriveled and cold, indicating the cutaneous torpor and internal congestion; in this case a very different class of diaphoretics will be demanded. In these cases copious draughts of warm, stimulating diaphoretic infusions, as the aristolochia, eupatorium, monarda, asclepias, etc., aided by stimulating ablutions and brisk frictions to the surface, will prove most beneficial. These measures tend to relieve the internal congestions or visceral engorgements, by inviting the blood back to the surface, and by the determination to, and excitement of the sudoriferous apparatus, diaphoresis is the result.

In the advanced periods of life, when diaphoretics are demanded, a very different class should be selected to meet the indications. In the diseases of old persons the reaction is feeble; instead of that vigorous constitution and corresponding reaction of youth, their diseases, both febrile and inflammatory, are not attended with a high grade of vascular excitement, and consequently our remedies, both internal and external, to produce diaphoresis, should be of a stimulant character. Nor is it necessary or proper to carry diaphoresis to the same extent, even in the same diseases in aged persons, that we should in the young and vigorous. In such cases we frequently find it necessary, as well as advantageous, to add spirits to even the exciting diaphoretic infusions, and to the warm ablutions.

In the various forms of pneumonia we avoid stimulating diaphoretics, except in the advanced stages of the disease, unless they are combined with nauseants and expectorants. In these cases cold or acidulated drinks, or even stimulating or exciting diaphoretics, unless modified by nauseants and sedatives, are improper. A similar modification in our external applications should be observed. In high grades of fever we admit cold air to the surface, cold ablutions, etc., the whole course being refrigerant during the excitement; but in pneumonia we keep the surface warm, apply warm ablutions, or warm and emollient fomentations to the surface, to invite the blood to the superficial capillaries, in order to relieve the hyperæmia of the lungs, and maintain constant diaphoresis. We resort to diaphoretics devoid of stimulating properties, as the asclepias tuberosa, etc., and we combine them with nauseants.

Diaphoretics are a very important class of remedial agents in all those diseases that arise from atmospherical vicissitudes. In these diseases, torpor of the sudoriferous apparatus constitutes the first link in the chain of morbid phenomena which follow, and diaphoretics constitute our most valuable therapeutic agents to restore that secretion, and thus remove the cause of the diseased action.

I. *Action in Fever.*—Diaphoretics are of primary importance in the treatment of all febrile affections; the class of diaphoretics, and the extent to which they should be carried in particular cases, can only be determined by the stage of the disease, the grade of excitement, the age and vigor of the patient, its congestive, sthenic or asthenic tendencies, etc. All of these circumstances must be taken into consideration in determining the extent to which diaphoresis should be carried, and the proper diaphoretics to be selected and used.

In the early stages of most fevers, if the patient is young and vigorous, copious and protracted perspiration should be secured and maintained by cold or tepid baths, by nauseants refrigerant and sedative diaphoretics, or they may be combined with those possessing stimulating properties. It is proper here to remark, that their employment should be preceded by the free use of cathartics, or emetics if indicated. In similar attacks of old persons, the stimulating diaphoretics and tepid ablutions should be employed, but in this case gentle diaphoretics alone are indicated. In the advanced stage of fevers, especially those of a typhoid type, free perspiration is too debilitating to be tolerated by the system, and should be avoided; but gentle diaphoresis or simple moisture of the surface is beneficial. If the fever is of an adynamic character, gentle and excitant diaphoretics, aided by tepid stimulating ablutions to the surface with brisk friction is very important.

Their sanative powers seem to depend upon a variety of influences which they exert upon the system. First, they remove the constriction of the cutaneous capillaries, and act as depletives by increasing the perspiratory function, and may therefore be regarded as antiphlogistic. Secondly, the evaporation which attends perspiration carries off the caloric, and thus lessens the abnormal heat of the system; in this sense they may be regarded as refrigerants. Thirdly, they equalize the circulation, by determining the blood to the surface; they remove congestion of internal organs. Fourth, they promote the elimination of morbid material from the blood, which if retained would prove a source of irritation, often producing fever, or if it already exists, it would tend to perpetuate it and render its type lower. They modify the condition of the skin, they soften and relax it, they lessen the heat and tension of it, and by an intimate sympathy existing between this extensive surface and every other organ or tissue of the body, a like salutary influence is exerted upon all.

II. *Action in Inflammation.*—The remarks which have been made relative to their utility in febrile disease, and to their therapeutic action, apply with equal force to their employment in inflammatory diseases. It will be recollected, that atmospheric vicissitudes play a very important part in the production of the phlegmasia, as well as fevers. When one organ or tissue is more disposed to take on morbid excitement than another, we meet with a local instead of a general disease; thus a number of persons exposed to the same morbific influences, may be the subject of as many different diseases; or but a small part of the number may contract disease, owing to the predisposition of some systems, or some organs to take on diseased action. Those who do not contract a disease are indebted for their escape to the sound and vigorous constitutions which they possess, for warding off the morbid influences, and securing them against its effects.

In inflammatory, as well as in febrile diseases, they are important as depletives, or antiphlogistics. They remove cutaneous spasms, lessen the morbid heat, abate the fever, produce sedation, invite the circulation to the surface, and thus act as revulsives, equalize the circulation, relieve pain, overcome the tension of the tissues implicated, and thus act as emollients, etc. They thus do as much, if not more, to effect a resolution of the disease than any other class of agents with which we are acquainted, providing proper perseverance and energy of action characterize their mode of employment.

The intimate sympathy existing between the cutaneous surface and the lungs, or between the functions of each, points to the employment of diaphoretics in pulmonic inflammation, as a class of remedial agents of singular efficacy. When perspiration is copious, the skin moist and relaxed, respiration is less painful and less laborious, and the distress or oppression in the chest is mostly, if not entirely relieved. The functions of the skin and lungs, it will be recollected, are analogous in several respects, and a very close sympathy exists between the two. We would therefore suppose that any agent which would relax the skin, and increase its secretion, would prove beneficial in arresting inflammation of the lungs — and experience has proved this to be true.

The same remarks apply to their employment in dysentery and diarrhea. The most superficial observer has not failed to notice the immediate influence which the obstruction of the cutaneous transpiration often exerts upon the bowels. Here, also, we have the same continuous membrane, and the same continuous sympathy, and the modifications of the function of either membrane influences that of the other;

hence the great value of diaphoretics in these diseases. Diaphoretics, possessing anodyne and sedative properties, are of peculiar advantage in these cases. They are revulsives, determining the circulation to the surface, thus relieving internal hyperæmia. They are anodyne, and lessen pain and dysenteric tenesmus. By their anodyne and sedative influence they lessen the pain and irritation in the bowels, diminish the mucous and intestinal secretions, and also diminish the augmented peristaltic action upon which the frequent discharges are dependent. They excite the cutaneous emunctories, equalize the circulation, break up morbid sympathies, and throw off the excrementitious matters which if retained can not fail to derange the system, and increase the existing disease.

III. *Action in Rheumatism.*—Diaphoretics are of much importance in rheumatism, and they probably owe their beneficial influence not only to the effects which have been before alluded to, but also to their eliminative action in removing from the system a morbid material upon which the disease depends. Dr. Williams states that "The *perspiratory secretion* contains lactic acid and lactates of soda and ammonia, which probably proceed from the transformation or decay of the textures, particularly the muscular, which the recent researches of Liebig have shown to contain a preponderance of this acid. Hence these products abound during great muscular exertion, and when perspiration is checked by external cold, they may be retained in the blood, causing rheumatism, urinary disorders, or various cutaneous diseases. The very serious effects sometimes resulting from sudden cold on the perspiring body may be partly owing to the same cause, as well as to the disorder produced in the circulation. Rheumatism is especially liable to occur as an effect of cold, where the body is fatigued with much muscular exertion; and I have frequently observed that the rheumatism chiefly affects the limbs which have been most exercised. Where the skin fails to excrete, an increased task is thrown on the kidneys, whence may result various diseases of these organs; and if these organs fail in the task, the lactic acid accumulates in the blood, and probably acting as a ferment, causes the formation of more, and of the kindred products, lithic acid and its compounds and products; these, in inflammatory subjects, excite rheumatic fever; in cachetic persons, miliary fever, erysipelas and pemphigus; and in more torpid frames, various local rheumatic or gouty affections. All these cases are frequently remarkable for the acid character of the cutaneous and renal excretions; and in a few instances, the blood has been found to possess acid qualities, or to be deficient in its usual alkaline reaction."

The direct action of diaphoretics in this disease is, then, to stimulate the sudoriferous apparatus to increased elimination, and as *lactic acid* is a normal constituent of this secretion, it is removed from the system in large quantities; *lactic acid* being the supposed cause of rheumatism, its removal is followed by a cessation of the disease. Such agents as increase both the secretions from the skin and kidneys, prove most advantageous; and as the materies morbi is an acid, we would suppose that alkaline diaphoretics and diuretics would prove the most valuable agents, and experience fully substantiates this conclusion. As the type of such a diaphoretic, we may mention the compound of asclepias tuberosa (℥j.), eupatorium perfoliatum (℥j.), sanguinaria canadensis (ʒij.), and nitrate of potassa (℥ij.); in this we have active diaphoretic and diuretic agents, with the alkali to neutralize the excess of acid.

Again, by promoting perspiration, we cause relaxation of the system, equalize the circulation, and remove the tension of the inflamed part. To fulfill these indications, we not only administer diaphoretics, but we also resort to emollient fomentations, to the alcoholic vapor-bath, to embrocations, brisk frictions, etc., to relieve the pain, subdue the irritation and inflammation, and assist in producing diaphoresis. Moderate diaphoresis sometimes gives much relief in gout, but the employment of these agents is not as beneficial as it is in rheumatism.

IV. *Action in Cutaneous Diseases.*—In the acute exanthematous diseases, this class of agents proves very beneficial. Moderate diaphoresis tends to advance the eruption, and moderate the febrile action, and in cases where the eruption is tardy, or where there has been a retrocession of the eruption, stimulating diaphoretics, aided by tepid ablutions of an excitant character, are of decided utility.

In the chronic cutaneous forms of disease, as in *herpes*, *lepra*, etc., a moderate moisture of the surface, promoted by the use of the medicated vapor-bath, continued for weeks, or even months, constitutes an important part of our remedial treatment.

V. *Action in Dropsy.*—In dropsies they are less beneficial than we might be led to suppose. From the large quantity of serous fluid which they evacuate, we should suppose they would be important, but experience does not confirm this view; they occasionally, however, prove important. In dropsy it is difficult to induce sweating; if, however, we succeed, advantage results from their use. The use of the tepid-bath, with brisk frictions to the surface, tends to invite the circulation to the skin, restore the perspiratory function which is always torpid, and promote absorption, which is an indication worthy of our attention in this disease.

VI. *Action in Disease of the Kidneys.*—The kidneys are closely connected in function with the skin, and when either is diseased the other performs a vicarious function, its secretion being increased to make up for the deficit in the other. Thus in suppression of urine, the perspiration sometimes acquires a marked urinous odor, and when the skin fails to perform its function, the secretion of the kidneys is increased. From these facts we can readily appreciate the importance of diaphoretics in renal diseases. Thus, in nephritis, no measures that can be adopted will produce such speedy relief as the production of free diaphoresis; they not only equalize the circulation, and thus remove the congestion of the kidneys, but they likewise remove much of the material that would have been excreted by the kidney in its normal condition. The same remarks will apply to other acute diseases of these organs.

Suppressed or diminished perspiration is supposed to exert some agency in the production of calculous affections. In some of these conditions of the system they may prove beneficial by removing the irritation of the kidney, and by causing the skin, for the time being, to perform a vicarious function.

We might extend the same remarks to their employment in diabetes. By determining to the surface, we change the organ of depuration, we throw the burden upon the skin and relieve the kidneys; hence the importance of the induction of a constant and free action of the skin. The frequent use of the hand-bath, accompanied with brisk frictions, cleanses the skin and invites the circulation to the surface, and gives the kidneys an opportunity to regain their normal vigor. In connection with this, hydragogue cathartics, stimulating diuretics, tonics and astringents, coöperate in effecting a cure.

RECAPITULATION.

1st. Diaphoretics are important both as depletives and eliminatives, lessening vascular repletion, and promoting the elimination of effete materials existing in the system.

2d. They overcome the vital tonicity and cohesion of the capillaries of the surface, and thus promote perspiration, equalize the circulation, counteract congestion, and serve to lessen fever and inflammation.

3d. By their excitant action on the sudoriferous follicles and capillaries of the surface, they act as mild, but none the less efficient revulsives, diverting excitement from internal organs, equalizing the circulation, and thus proving very efficient agents in the treatment of inflammation of any of the internal viscera.

4th. The surface is the great refrigerator (as well as one of the great depurating organs of the system), and hence the utility of suitable diaphoretic means and appliances; diaphoresis serving to carry off the morbid heat of the surface, and lessen the excessive generation of caloric. Either cold or warm ablutions, as well as internal agents, may facilitate this result.

5th. Diaphoresis promotes absorption by reducing the serum of the blood; and hence their utility in dropsies, particularly in those of a sthenic character.

6th. Diaphoresis exercises an emollient influence upon the entire surface, according to its degree, by which a soothing and relaxing influence is extended by contiguous and continuous nervous and capillary sympathy, to deep-seated and remote parts, lessening internal excitement and inflammation. By this means they may arrest fever or inflammation, modify or change its type for the better, if they do not effect a radical cure.

7th. They are useful both in acute and chronic diseases; free sweating being indicated as a general rule in the acute forms of disease, and an increase in the insensible transpiration in chronic affections.

8th. The extent of their use in acute disease, must depend upon its duration, they being used freely in the early stages, and before there is much exhaustion; and less freely, or even sparingly, after the patient has become prostrated by its duration.

9th. In diseases attended with a high degree of excitement, nauseating and sedative diaphoretics, with the free use of ablutions, either tepid or cold are demanded.

10th. In coldness of the surface, with a languid state of the circulation, accompanied with internal congestion, excitant and stimulating diaphoretics, assisted by warm or even hot stimulating baths, are indicated.

11th. In old age, and in the advanced stages of disease, if attended with debility, diaphoretics of a tonic and stimulating character are indicated.

12th. Suitable diaphoretic measures, modifying as they do every organic function of the body, are among our most important curative, as well as auxiliary means in the treatment of nearly all diseases.

SERPENTARIA.

THE ROOT OF ARISTOLOCHIA SERPENTARIA.—U. S.

PREPARATIONS. — Tincture of Serpentaria. Compound tincture of Serpentaria.

DOSE.—Of either tincture gtt. x. to ʒj.

THERAPEUTIC ACTION.—Serpentaria is diaphoretic, stimulant, tonic, stomachic and diuretic. It is especially valuable as a diaphoretic and tonic. To fulfill these indications in the treatment of disease, no article with which we are acquainted, surpasses the one now under consideration. It may be exhibited as a diaphoretic during the early stages of febrile and inflammatory diseases with advantage; but it is in the advanced stages, especially in typhoid fevers, that we have found it most important. Acting as it does upon many of the secretions, stimulating and promoting them, and as an excitant to the vascular system, while at the same time it exerts a sustaining influence on the enfeebled system, it is rendered an agent of rare virtues in the cases referred to. Prof Wood states, that it is admirably adapted to the treatment of typhoid fevers, whether idiopathic or symptomatic, when the system begins to feel the necessity for support, but is unable to bear active stimulation.

We have found the Serpentaria very useful in the exanthematous diseases, when the excitement was feeble, and the eruption tardy in making its appearance, for the purpose of facilitating the eruptive process. It is equally valuable when a retrocession has taken place, causing a determination to the surface, thereby relieving congestion of internal organs, and reproducing the eruption.

In small doses it promotes the appetite; in large doses it produces diaphoresis if the surface is kept warm, and diuresis if exposed to the cold air; it may also cause nausea, and act as an aperient.

PILOCARPUS—JABORANDI.

THE LEAVES OF PILOCARPUS PENNATIFOLIUS.—BRAZIL.

PREPARATIONS.—An infusion of the leaves. Tincture of Pilocarpus. Pilocarpin.

Dose.—An infusion of ʒiss. to ℥iv. of hot water may be taken in tablespoonful doses every ten minutes, to produce the full effect of the remedy. The tincture may be given in doses of gtt. x. to gtt. xxx. in hot water. The dose of Pilocarpin is one-half grain; it may be used by hypodermic injection in doses of one-eighth to one quarter of a grain.

Therapeutic Action.—Jaborandi is the most powerful diaphoretic known, and should only be employed when there is need for a prompt and efficient action upon the skin. The old word "sudorific" expresses the quality of the action, which resembles that obtained by the spirit vapor bath, with the use of the compound tincture of Serpentaria. The first influence of the remedy noticed (when taken in full doses) is a flushing of the face, and sometimes of the entire trunk, with increased fullness of the pulse, and occasionally pressure on the brain. Then perspiration breaks out in drops, and soon the patient is sweating from every pore.

It has been employed in commencing uræmia from scanty secretion of urine; in acute albuminuria; in puerperal convulsions; in tardy appearance or retrocession of the eruption in the eruptive fevers; in pulmonary apoplexy; in dropsy of the cavities, especially in hydropericardium, and hydrothorax.

The advantage of a powerful remedy like Pilocarpin, which may be held in solution and used by hypodermic injection, is, that it offers a powerful means of acting upon the skin, and providing revulsion, when the patient is unconscious, and can not take the ordinary remedies.

It has not been named as a remedy for Asiatic cholera, and possibly has not been tested in this disease. Yet I should think, from the influence it exerts upon the circulation, and upon the skin, that it might prove curative. I will be sure to test it if I see another epidemic of this disease.

Jaborandi is thought to be a true galactagogue, increasing the secretion of milk, in doses short of diaphoresis. When studied in small doses, it will probably serve other useful purposes in the practice of medicine.

ASCLEPIAS.

THE ROOT OF ASCLEPIAS TUBEROSA.—U. S.

PREPARATIONS.—An infusion. Tincture of Asclepias. Asclepin.

DOSE.—The infusion may be taken freely. A drachm of the tincture added to ℥iv. of water may be given in teaspoonful doses. The dose of Asclepin is gr. ½ to gr. j.

THERAPEUTIC ACTION.—The Asclepias is diaphoretic, expectorant and laxative. In addition to these properties, it is said to possess those of a subtonic, diuretic, carminative and antispasmodic character. These, as well as its cathartic properties, are too feeble to render it a reliable agent in cases requiring active remedies.

The Asclepias acts as a diaphoretic and expectorant without sensibly increasing the action of the heart and arteries, or heat of the surface. We have found it a mild, slow, but pretty sure diaphoretic, acting conspicuously upon the pulmonary mucous membrane, promoting expectoration. It rarely, if ever, produces profuse diaphoresis, but in a short time after it is administered, the skin will be observed to feel soft and cool, and slightly moist. It is. a valuable remedy in pleurisy, pneumonia, bronchitis, and other pulmonary diseases, if given to the extent of producing a softened state of the skin, and free diaphoresis.

The *Asclepias Syriaca* is diaphoretic, expectorant, diuretic, and said to be anodyne; it is supposed to possess properties analagous to the preceding species. It has undoubtedly been too much neglected by the medical profession, its medical virtues justly entitling it to a notoriety which has not been awarded it. It appears to be diaphoretic and expectorant, like the preceding article, and it is said to exert an anodyne and soothing influence upon the system.

ASCLEPIAS INCARNATA.

This variety of the Asclepias is said to possess properties similar to the others, though in large doses it acts as an emetic and cathartic. Its properties and therapeutic application have not been properly investigated. Tongo and Durand, in their

Manual of Materia Medica, include it with the Syriaca, and say they are used with success in the same doses, and in the same manner as the Tuberosa, in pectoral affections, etc. Dr. Tully states that the root of this species may be advantageously administered in catarrh, asthma, rheumatism, syphilis, and verminous affections.

IPECACUANHA.

Ipecacuanha deserves a notice here, as it enters into many of our most efficient diaphoretic compounds. (For general description, see Emetics.) In small doses, as one grain, repeated every two, three, or four hours, or oftener, it produces a relaxed and softened state of the skin, with slight diaphoresis. It is, however, rarely used alone, being combined with other agents, especially opium, adding much to the efficiency of the preparation.

Pulvis Ipecacuanha et Opii Compositus.—Diaphoretic Powder.—℞ Opium ʒss., camphor ʒij., Ipecacuanha ℥j., bitartrate of potash ʒviij. Pulverize separately and mix.

This preparation is useful not only for its diaphoretic but also for its anodyne effects. It is used in the forming stages of fevers and inflammatory affections, in coughs, colds, nervous irritation, etc., as a diaphoretic and anodyne. It is frequently combined with other diaphoretics, as Asclepin, and with antiperiodics in the treatment of intermittent diseases.

Pulvis Ipecacuanha Compositus—Dover's Powders.—℞ Ipecacuanha in powder, opium in powder, *aa.* ʒj., sulphate of potash powdered, ℥j. Mix.

"This powder acts as a powerful sudorific, and is very efficaciously given in all cases, whether inflammatory or not, in which sweating is indicated, the relaxant power of the ipecacuanha acting upon the skin. The dose is from five to ten grains, diffused in mucilaginous fluid, or in the form of bolus.

OPIUM.

Opium, the general properties of which will be considered under the class of Narcotics, is a very important diaphoretic. In cases where there is a dry and constricted state of the surface, restlessness, nervous excitability or irritability, as in fevers, inflammatory diseases, etc., the anodyne, sedative, and tranquilizing influences of opium are almost invariably accompanied by a relaxation of the surface and free perspiration; this is especially the case if aided by quiet, warmth, and the free use of warm diluents. Ipecacuanha, camphor, nitrate of potash, and other nauseating and sedative agents, associated with opium, greatly contribute to accomplish this desirable end. Ablutions, either cold or tepid, according to the state of the surface, and depressed or exalted manifestations, are likewise powerful auxiliary measures in securing the fulfillment of this indication.

ANTHEMIS.

THE FLOWERS OF ANTHEMIS COTULA

Dose.—Of infusion, one ounce to a pint of boiling water, from one to two ounces, or more if indicated.

Therapeutic Action.—Wild Chamomile possesses sudorific, tonic, emetic, and rubefacient properties. Although but little used as a diaphoretic, yet it affords us an admirable one in certain cases. In low grades of fever, where the vital powers are depressed, or where there is congestion of internal organs, with a cold, shrunken, or shriveled condition of the surface, a weak and warm infusion of this article exerts a decided influence in determining the circulation to the surface, and promoting diaphoresis.

LOBELIA SYPHILITICA.

Dose.—Of the powdered root of Lobelia Syphilitica, from grs. xx. to ʒj, taken in some warm diaphoretic infusion; of a decoction of an ounce to a pint of water, from one to three ounces.

Therapeutic Action.—Lobelia Syphilitica is diaphoretic, diuretic, emetic, purgative, and said to be antisyphilitic. Its medical properties and uses, however, are but very imperfectly understood. The root, when administered in small doses, acts as a sudorific and diuretic; in larger doses, as an emetic and cathartic. Rafinesque states that it is chiefly sudorific and diuretic. It was employed by the Indians as a specific in the treatment of syphilis; the secret of its use was purchased of them by Sir H. Johnson. Its utility in this disease requires confirmation; indeed, the limited trials made with it have shown that it possesses no powers of this kind.

Lobelia Cardinalis.—The *Cardinal Flower*, according to Griffith, possesses much the same properties as the agent last considered. It is also recommended as a valuable discutient poultice to glandular swellings, painful tumors, etc. It is used principally in decoction, one ounce to a pint of water. *Dose*, one to two ounces, repeated as often as necessary.

POLYGONUM PUNCTATUM

Dose.—This agent is principally given in infusion, one ounce to a pint of boiling water. Dose from one to two ounces.

Polygonum Punctatum, fully considered under the division Emmenagogues, possesses pretty active stimulating diaphoretic properties, together with others of a diuretic, expectorant, and antiseptic character, which render it a very efficient agent in some forms of disease. As a stimulating diaphoretic it is an excellent remedy, taken in the form of warm infusion, in sudden suppression of the perspiration, in colds, febrile and inflammatory diseases, and especially when the action of the heart is depressed from internal congestion, with coldness of the surface and deficient capillary circulation.

DIOSCOREA.

THE ROOT OF DIOSCOREA VILLOSA.

Preparations.—An infusion. Tincture of Dioscorea. Dioscorin.

Dose.—The infusion may be taken in doses of ʒj., the tincture gtt. j. to gtt. xxx. Dioscorin gr. j.

Therapeutic Action.—The Dioscorea is diaphoretic, anodyne, antispasmodic, anti-emetic and expectorant. It seems to act as a very gentle diaphoretic, without exciting the action of the heart and arteries, or increasing the temperature of the body. It has been but little used, however, for this purpose, although it might undoubtedly be employed with much advantage. It appears to act as an anodyne and antispasmodic, and likewise as an anti-emetic in the disease in which it has been principally employed. The only affection in which it has been used sufficiently to give a fair test to its virtues, is *bilious colic.* In many instances it has appeared to act with great promptitude in allaying nausea and vomiting, and relieving the pain and spasmodic action invariably present in that disease. In various cases of great severity, where other remedies had been faithfully and perseveringly employed, and when all had proved unavailing, the nausea and vomiting, severe pain and spasms continuing unabated, with a dry and husky state of the surface, the Dioscorea has afforded entire relief in every respect, in twenty or thirty minutes, and the patient has fallen into a comfortable state of repose, and slept quietly the first time since the attack.

PTEROSPORA.

THE ROOT OF PTEROSPORA ANDROMEDA.

DOSE.—Of the Pterospora, in powder, from grs. xx. to half a drachm, or even one drachm, every twenty or thirty minutes, or less often, in sweetened water. Of an infusion, of half an ounce to a pint of boiling water, one to two ounces.

THERAPEUTIC ACTION.—Pterospora is one of our most powerful and efficient diaphoretics, yet, from its scarcity, it has not yet come into general use. It has been employed as a sudorific or diaphoretic, in febrile affections, with great advantage. It is used in all forms of fever, but especially in those of a typhoid, continued or remittent character. If taken freely, it produces free perspiration without accelerating the action of the heart, or increasing the temperature of the body; but, on the contrary, it appears to exert the reverse influence, and stops, as Rafinesque asserts, the fever in a few hours.

POLEMONIUM.

THE ROOT OF POLEMONIUM REPTENS.

PREPARATIONS.—An infusion. Tincture Polemonium.

DOSE—The infusion may be taken in doses of one ounce. The tincture in doses of gtt. v. to gtt. xx.

THERAPEUTIC ACTION.—Polemonium is diaphoretic, expectorant and excitant. It appears to act principally as a diaphoretic and expectorant. As a diaphoretic it is exhibited in febrile diseases, and inflammations of the respiratory apparatus. In the different forms of pulmonic inflammation, pleurisy, bronchitis, etc., a warm infusion has been found admirably adapted to the production of diaphoresis, the promotion of expectoration, and the cure of the disease. It appears to be best adapted to the relief of febrile diseases attended with coldness of the surface, a dry, torpid, and constricted state of the skin, with general languor, and internal venous congestion.

It is a popular and valuable remedy in chronic pulmonary diseases—as catarrhs, asthma, bronchitis, coughs, and even consumption, keeping up a constant determination to the surface, and thus relieving the parts diseased, as well as exerting a stimulating and eliminative influence upon the system. It is also regarded as worthy of much attention in chronic diseases of the liver, and with many it enjoys a high reputation in these affections.

HELENIUM.

THE HERB OF HELENIUM AUTUMNALE.—U. S.

Dose.—Of the powdered plant, ʒss. to ʒj., given in some warm infusion; of an infusion of half an ounce to a pint of boiling water, one to two ounces, and repeated as often as may be necessary to secure its effects.

Therapeutic Action.—Helenium is diaphoretic, tonic, expectorant, errhine, anthelmintic and expectorant. It is a new remedy, whose properties are not as yet well understood. It is valuable as a diaphoretic and aperient in debilitated conditions of the system requiring the use of remedies capable of fulfilling the indications named, and especially useful as a tonic and excitant in the advanced stages of typhoid fever.

CAMPHORA.

Dose.—Of Camphor as a diaphoretic, from one to ten grains. given in the form of emulsion.

Camphor is a valuable diaphoretic, and may be used to fulfill this indication in almost every state of febrile and inflammatory disease. Its operation may be promoted by the free use of tepid diluents, and by associating it with opium, Ipecacuanha, nitrate of potash, etc., in the several cases in which these remedies are found beneficial.

It is useful in various nervous affections, chronic and even acute rheumatism, gout, irritation of the urinary organs, etc.

EUPATORIUM.

Dose.—Of an infusion of one ounce to a pint of boiling water, from one to four ounces.

Eupatorium Perfoliatum, or *Boneset,* the properties and uses of which are fully described under the class of tonics, is a valuable diaphoretic. An infusion, taken freely while warm, is highly useful in promoting perspiration in colds, coughs, pneumonia, inflammation, and the various forms of fevers, especially in the early stages, if given to the extent of producing nausea and vomiting. It is also useful in smaller doses, in the advanced stages of the same diseases, when a sustaining diaphoretic is demanded.

EUPATORIUM AROMATICUM.

White Snake-root, described under the class Antispasmodics, is a valuable diaphoretic, expectorant, and antispasmodic. It is particularly useful as a diaphoretic in acute pneumonic inflammations, and is also valuable for its expectorant properties. For this purpose it is exhibited freely in the form of a warm infusion.

SAFFRON.

THE STIGMAS OF CROCUS SATIVUS.

Dose.—Of the powder, grs. x. to grs. xx.; of an infusion of one drachm to a pint of boiling water, two to four ounces.

Therapeutic Action.—Saffron is diaphoretic, stimulant, emmenagogue, and antispasmodic. Its medical virtues have been variously estimated; while some have ascribed great importance to it as a stimulant, antispasmodic, or narcotic, others have assigned to it a prominent place among emmenagogue and diaphoretic agents, while by many at the present day it is regarded as an agent devoid of any active properties.

It is a popular remedy in domestic practice, especially in exanthematous diseases; and inasmuch as it is more frequently used as a diaphoretic than for any other purpose, we have thought proper to arrange it under this class.

CARTHAMUS.

THE FLOWERS OF CARTHAMUS TINCTORIUS.

Dose.—Of an infusion of half an ounce to a pint of boiling water, from two to six ounces, repeated as often as may be necessary.

Therapeutic Action.—The Carthamus is diaphoretic and laxative, and very frequently used as a substitute for saffron. It does not appear to be possessed of very active properties, and is mostly employed as a diaphoretic in the eruptive diseases, as scarlatina, measles, etc., for which purpose a warm infusion may be taken freely. It is employed frequently as a laxative and diaphoretic in diseases of infants, and is a very mild, safe, and unirritating remedy.

ASARUM.

Dose.—Of the pulverized root from gr. xx. to one drachm; of an infusion of one ounce to a pint of boiling water, one to three ounces.

Wild Ginger, described in the class Emmenagogues, is decidedly diaphoretic and excitant, and when a weak and warm infusion is drunk, or when the powder is employed in small and repeated doses, aided by warm diluents and confinement to bed, it rarely fails to cause a determination to the surface, and induce copious perspiration. It is sometimes used in sudden colds, catarrhal, febrile and inflammatory affections, when the skin is harsh and dry, and the perspiratory action arrested, with the best effects.

HEDEOMA.

THE PLANT OF HEDEOMA PULEGIOIDES.—U. S.

Dose.—The infusion may be taken in any quantity that the stomach will bear. The dose of the oil is gtt. v. to xv.

Therapeutic Action.—Pennyroyal is diaphoretic, emmenagogue, and stimulant. It constitutes a grateful aromatic stimulant and diaphoretic, and is used with advantage in febrile and inflammatory diseases, as a warm diaphoretic drink, when pleasant to the patient. It is a popular remedy in sudden colds, suppressed menstruation, flatulent colic, spasm of the stomach and bowels, etc. In suppressed lochia it is probably one of our most efficient remedies, and is one that we have used almost to the exclusion of any other, and with the best results.

SASSAFRAS.

The bark of the root of the *Laurus Sassafras* is diaphoretic, stimulant, antiseptic and alterative. It is employed in the form of a warm infusion, with a view to exciting the capillary circulation of the surface in both acute and chronic exanthematous fevers. In variola rubeola, scarlatina, etc., many of our practitioners think it one of the most valuable articles known. It is regarded as acting specifically upon the disease, and in cases of retrocession of the eruption, or when slow in making its appearance upon the surface, or when it is imperfectly developed, an infusion may be used with a prospect of advantage to the patient.

GUAIACI LIGNUM.

DOSE.—Of a decoction made of guaiacum one ounce to a pint and a half of boiling water, and boiled down to a pint, from two to six ounces.

Guaiacum Wood is diaphoretic, stimulant and alterative. A decoction produces warmth in the stomach, increases the temperature of the surface, and if the patient is warmly covered in bed, and the decoction taken warm, it acts as a gentle diaphoretic; but if the surface is exposed to the air, diuresis follows.

GUAIACI RESINA.

DOSE.—Of the Guaiacum, from grs. x. to ʒss., in pill, bolus, or emulsion.

Guaiacum Resin acts as an acrid stimulant, causing vascular excitement, increased warmth of the surface, with augmented activity of the secreting organs—as the skin and kidneys. Used in connection with diluents, the skin being kept warm, it acts energetically as a sudorific; if the surface is kept cool, however, its action is manifestly directed to the kidneys.

GERARDIA PEDICULARIA.

Dose.—Of an infusion of an ounce to a pint of boiling water, two to three ounces.

Therapeutic Action.—The plant is said to be an important diaphoretic and febrifuge. Dr. Waun, of Alabama, acquired some knowledge of its efficacy as a remedy in domestic practice, and was induced to communicate the results of his inquiries respecting the Gerardia to the Eclectic Medical Institute, in order to secure a full trial of its virtues. He states that upon the supervention of a febrile attack, the free use of this article occasioned free perspiration, and effectually arrested the fever. It has been employed to a limited extent by Eclectic practitioners as a diaphoretic and febrifuge, and bids fair to answer a valuable purpose as a remedial agent. The plant deserves further investigation.

PYCNANTHEMUM.

The Pycnanthemum Virginicum, or *Prairie Hyssop*, noticed under the class of stimulants, if taken freely in the form of warm infusion, acts promptly as a diaphoretic. It may be employed in sudden colds, checked perspiration, and in the early stages of febrile and inflammatory diseases with advantage as a diaphoretic. It is quite similar to hyssop, rosemary, and the mints, in its properties.

PLATANUS.

Dose.—Of an infusion of one ounce to a pint of boiling water, from two to six ounces.

The bark and twigs of the Platanus Occidentalis, or *Sycamore*, is said to be diaphoretic, diuretic, anodyne, and antispasmodic. It is sometimes employed in infusion in the acute exanthematous fevers—as measles, scarlet fever, etc.—when the eruption is slowly or imperfectly developed, or when it recedes. It is used as a diuretic in nephritic affections, calculous irritation, and other diseases of the urinary organs. It has also been used in pertussis, night-sweats, and dysentery, with advantage. We have used a strong decoction of the bark of this and the white oak in night-sweats, the infusion being used internally at the same time.

ICTODES.

Dose.—Of the recent root, from grs. v. to grs. x.; but if dry and long kept, the dose will have to be increased to grs. xv. or ʒss. mixed in simple syrup, or warm water sweetened.

Ictodes Fetida, or *Skunk Cabbage*, described in the class Expectorants, is decidedly diaphoretic as well as expectorant. It exerts a specific influence over the cutaneous exhalants, causing a relaxed and softened state of the skin, a determination to the surface, and gentle perspiration. The powder or infusion, given in repeated doses, not only causes perspiration, but promotes the secretion and expectoration of bronchial mucus; hence it is a very valuable agent in the treatment of pulmonary affections.

ARALIA SPINOSA.

This species of Aralia, commonly called *Southern Prickly Ash*, or *Angelica Tree*, is highly stimulant as well as diaphoretic. The bark is employed as a stimulant diaphoretic in chronic rheumatism, spasmodic affections, etc., in the form of a decoction, which, if taken warm and freely, causes free perspiration.

XANTHOXYLUM.

Xanthoxylum, or *Prickly Ash*, is also diaphoretic as well as stimulant, and owes much of its curative influence to this property. The warm infusion, if taken freely, and aided by external heat, warm pediluvia, etc., will act powerfully as a diaphoretic; it is principally used in torpid states of the system, and when a stimulating agent is required.

MEZEREUM.

Mezereum, described under the class of Alteratives, is a stimulating diaphoretic, and has afforded much benefit in the treatment of cutaneous diseases and chronic rheumatism. It is rarely employed with a view to the production of free perspiration or sweating, but for the purpose of augmenting the insensible transpiration, for which it is esteemed valuable in the treatment of many chronic affections.

INULA.

DOSE.—Of the powder, from grs. xx. to ʒj.; of a decoction of an ounce to a pint of boiling water, one to three ounces.

Inula Helenium, or *Elecampane*, if taken in the form of a warm decoction or infusion, acts very conspicuously upon the cutaneous emunctories, causing diaphoresis. Its effects are greatly augmented by the application of external heat and quiet. It has been esteemed useful in both acute and chronic catarrhal affections, and in the acute exanthemata, when the eruptive process is not perfected, and when a stimulating diaphoretic seems to be required. In sudden colds, check of perspiration, and cough, a warm infusion of Inula answers an admirable purpose.

ZINGIBER.

Ginger, in addition to its stimulant properties, under which class it is considered, is highly diaphoretic, and often used to fulfill this indication. In sudden colds, checked perspiration, etc., a warm infusion, taken freely, and aided by external warmth, and the hot pediluvia, exerts a very decided influence upon the cutaneous emunctories in causing sweating. It is much used in this way in domestic practice, and often with very satisfactory results. It is an excellent stimulant and carminative in flatulency, borborygmus, and spasm of the stomach and bowels, caused by eating green fruit or irritating articles of diet.

ANGELICA.

The roots and seeds of the Angelica Atropurpurea and other species, if used in the form of a warm infusion, will promote the perspiratory function, and are frequently employed for this purpose in colds, coughs, and the incipient stages of many of the mild forms of fever. The infusion or tincture is highly esteemed by many as a gastric stimulant in spasmodic colic, flatulence, pain in the breast, hysteria, and other nervous disorders.

MENTHA.

The Mentha Piperita and M. Viridis, are decidedly diaphoretic. The *Spearmint* is to be preferred to the *Peppermint,* it being more energetic and certain in its action, and generally more acceptable to the stomach. The warm infusion should be taken liberally, the patient at the same time keeping quiet and warmly covered up in bed. In the incipient stages of the milder forms of fever, and other diseases, especially if accompanied with nausea and vomiting, or a morbidly irritable state of the stomach, a strong infusion of the mint will be found an appropriate and useful diaphoretic. In flatulence, colic, spasm of the stomach and bowels, etc., it is an excellent stimulant and carminative.

MONARDA.

Dose.—Of an infusion of one ounce to a pint of boiling water, one to six ounces.

The Monarda Punctata, and other species of *Horsemint,* possess highly excitant, together with very energetic diaphoretic properties. The warm infusion of either of the medicinal species of the Monarda, if taken freely, and while the patient is warmly covered in bed, rarely fails to induce copious perspiration. Owing to its highly excitant action it is more especially applicable to torpid states of the system, with diminished action of the various secreting organs, but more especially the skin and kidneys. An infusion seldom fails to act promptly upon these emunctories, and is also useful in flatulence, flatulent colic, spasm of the bowels, nausea, etc.

SATUREJA.

The Satureja Hortensis, or *Summer Savory,* like the sage, is an excitant diaphoretic, if used in the form of warm infusion. It is more exciting than the latter article, but employed in pretty much the same cases and in the same way. In the early stages of febrile and inflammatory diseases, colds, pulmonary catarrhs, etc., the warm infusion, aided by other suitable means, is capable of producing free sweating, and often effectually breaking up the attack. It is but little used.

CUNILA.

The Cunila Mariana, or *Dittany*, is a mild diaphoretic and excitant. It is but little used, perhaps never in regular practice; but in domestic practice it is employed in colds and slight affections, with a view to the induction of diaphoresis, for which purpose it corresponds with the balm, sage, hyssop, etc.

ROSMARINUS.

The Rosmarinus Officinalis, or *Rosemary*, is described under the classes of Emmenagogues and Stimulants, and requires but a passing notice in this place. It is a stimulating diaphoretic, adapted to the fulfillment of this indication in colds, and mild febrile attacks. It is similar to the dittany, hyssop, sage and thyme, and used in the same cases.

SALVIA.

A strong infusion of the Sage acts beneficially as a diaphoretic in simple forms of disease, as colds and mild fevers, when but little medicine, and that not of an energetic character, is needed. The warm infusion, aided by other appropriate measures, acts as a gentle diaphoretic, very materially increasing the cutaneous transpiration; it also proves serviceable as a diluent.

HYSSOPUS.

Hyssop, used freely in the form of warm infusion, proves highly beneficial as a remedy in the incipient stages of those diseases arising from the influence of cold acting upon the system when in a state of perspiration, and arresting that function. In the simpler forms of disease this agent will cause a determination to the surface, relieve internal congestions, and if assisted by other appropriate measures, will produce free perspiration.

THYMUS.

Thyme is another of the aromatic stimulants that is often used in warm infusion to promote the perspiratory process. It is applicable to most cases in which the hyssop, satureja, sage, etc., are used, and may be exhibited in the same manner.

EMETICS.

Ipecacuanha, already named as a diaphoretic, and many other agents of this class, exert a similar influence. Most of them, and perhaps all, produce this effect by virtue of their nauseating, relaxing and sedative properties; they are consequently indirect in their action. Agents of this class, if given in small and repeated doses, so as to keep up continued nausea, rarely fail to produce relaxation of the cutaneous tissues accompanied with increased diaphoresis. They are exceedingly valuable in febrile and inflammatory diseases, to maintain a constant relaxation of the skin, decrease the force and frequency of the circulation, and keep up continued perspiration. They serve to produce a state of relaxation and depression incompatible with that exalted vital action, tension and rigidity which invariably exist in high grades of fever, or in the acute phlegmasia, as in pneumonia, inflammation of the serous membranes, acute rheumatism, etc. We have then to regard them as exceedingly valuable indirect diaphoretics —Lobelia, Sanguinaria, Euphorbia, Gillenia, Apocynum, Verbena, etc., are among the most valuable agents of this class which contribute to the production of diaphoresis under the circumstances named.

POTASSÆ NITRAS.

Dose.—Of Nitrate of potash, from grs. x. to ʒss., mixed with sugar or taken in solution. If taken as a refrigerant, it should be dissolved in water, and swallowed immediately.

Therapeutic Action.—Nitrate of Potash is diaphoretic, diuretic, antiseptic, refrigerant and sedative. If taken in doses of one ounce, it acts as a poison, and has caused death in several instances. Its effects, however, are by no means uniform; for in other cases the same quantity has been known to exert no injurious effect upon the system. When taken in poisonous doses, it acts as an acro-narcotic, causing nausea and vomiting, violent pain in the bowels, with free catharsis or bloody stools, indicating gastro-intestinal inflammation, together with a disordered state of the nervous system, marked by giddiness, convulsions, disposition to syncope, palsy, etc. When taken largely diluted with water, its poisonous effects seem to be much lessened, or very nearly lost. The amount of dilution, and the use or abstinence from diluents after taking it, may account for the discrepant statements regarding its action.

In medicinal doses it acts as a diaphoretic, diuretic, refrigerant and sedative—its refrigerant and sedative influence being most readily appreciated when the surface is preternaturally hot, as is the case in febrile and inflammatory disorders. It greatly diminishes the force and frequency of the pulse, often from 70 to 60 beats in a minute, in a short time. Sunderlin says, "Nitre diminishes the orgasm and plasticity of the blood, perhaps by a chemical action on the cruor and fibrine."

Its action on the urinary organs is clearly manifested by the increased secretion and presence of the salt in the urine. It belongs to the class of renal depuratives, greatly increasing the solids of the urine. Like other neutral alkaline salts, it often acts upon the bowels, and if long continued, it frequently gives rise to pain and griping.

It has been found a very efficient prophylactic in habitual attacks of cynanche tonsillaris, or *quinsy*, and is also very valuable in shortening the paroxysm. Several cases have come under our notice where it has been used in this way.

It is also efficacious in obstinate spasmodic asthma, in shortening the paroxysm. A very convenient and effectual mode of exhibition, is in the form of nitrous fumigations, consisting in inhaling, for fifteen or twenty minutes, the smoke of burning paper, prepared by dipping it in a saturated solution of nitre, and afterward drying it.

LIQUOR POTASSÆ CITRATIS.

Dose.—Of this preparation, one-half ounce, diluted with water, once in one, two, or three hours, according to symptoms. It is often used extemporaneously, in the form of an effervescing draught, as—℞ Lemon juice ℥ss., carbonate of potash grs. xv., water ℥ss.; dissolve the potash in the water, and mix the two, and take while in a state of effervescence.

Solution of Citrate of Potash, or *Neutral Mixture*, is an excellent refrigerant diaphoretic, remarkably well adapted to the relief of febrile conditions, as a hot and dry state of the skin, and much thirst. It is found particularly useful in intermittents and remittents; this is especially the case when taken in a state of effervescence. The carbonic acid seems to cover the taste of the citrate of potash, and adds to the diaphoretic powers of the salt its own quieting influence on the stomach.

LIQUOR AMMONIA ACETATIS.

DOSE.—The dose is half an ounce every two or three hours.

THERAPEUTIC ACTION.—Solution of Acetate of Ammonia, or *Spirit of Mindererus*, is diaphoretic, stimulant, diuretic, and refrigerant. It is regarded by allopathic physicians as a certain and efficient diaphoretic in febrile and inflammatory diseases. It has been much used as a stimulant in certain stages of these diseases, when opium, alcohol, wine, etc., are inadmissible, owing to the cerebral excitement which they occasion. When employed as a diaphoretic it is liable to augment the urinary secretion, and this is especially the case when cold air is brought in contact with the surface, and when exercise is taken. In order to secure its full advantages as a diaphoretic, the patient should be kept still in bed and warmth applied to the surface.

Externally, it has been employed as a discutient and resolvent, in mumps and other local inflammatory diseases; it is applied by saturating several thicknesses of flannel, and keeping them constantly wet on the part.

TOPICAL DIAPHORETICS.

CALORIC.

Heat properly applied to the surface of the body is not only an important auxiliary agent to the use of diaphoretic remedies, in the production of perspiration, but it is also one of the most powerful single measures in the hands of the physician of producing determination to the surface, relaxation of the skin, and sweating.

Either *dry* or *moist* heat, if applied to the surface at a temperature exceeding that of the body, acts as a general excitant, increasing the fullness and frequency of the pulse, the heat of the surface, and its secretion. If applied to the surface a few degrees below that of the body, it exerts a soothing and relaxing influence upon the cutaneous tissue, lessening exalted capillary action in the vessels of the surface, removes constriction, and strongly disposes to perspiration.

WARM AIR.

Air, when heated to the temperature of from 85° to 100°, and brought in contact with the surface of the body by placing a burning lamp under the chair upon which the patient is seated, surrounding the body with a blanket, the head being uncovered, or by conducting the heated air through a tube under the bed-cover, thus bringing it in contact with the body, exerts a gentle excitant influence on the cutaneous tissue, and occasions copious perspiration. It seems to exert a soothing, tranquilizing influence on the nervous system, and in this way also predisposes to diaphoresis. It is said by Dr. A. T. Thompson, to surpass either the warm water or vapor-bath, for certainty of producing sweating. The warm-air bath has been found beneficial in chronic, deep-seated neuralgia, in rheumatism, both acute and chronic, in the early stages of febrile and inflammatory diseases, chronic cutaneous diseases, etc. By elevating the temperature, it becomes excitant, and may be used in violent spasmodic action, internal congestions, etc. Its diaphoretic effects will be much aided by using some mild, warm, diaphoretic infusion, one or two doses of the Sudorific Tincture, or, when sweating has commenced, by copious draughts of cold water.

ALCOHOLIC VAPOR BATH.

This is very similar to the warm air bath, consisting principally in the application of hot air to the surface, very little vapor being generated by burning alcohol. The vapor or heat of burning alcohol, or some dilute alcoholic liquid, may be applied to the surface in a similar manner to the application of hot air. The most common way of employing it is to place the patient in a wood-seat chair, place his feet in a bucket of hot water, and surround him with a blanket, so as to keep in the heat. Then take a shallow vessel, as a saucer or plate, pouring it part full of alcohol, diluted so that the flame will not rise high enough to burn the patient, slip it under the chair, and light it with a match or piece of paper. During the time of taking the bath, the patient should take some diaphoretic internally, as the sudorific tincture, diaphoretic powder, or some warm diaphoretic infusion. This process may be continued from ten to thirty minutes, according to the vigor of the constitution, the effect produced, or the intractable character of the disease. If the patient can not sit up, the vapor may be conducted under the cover, by raising it from the side of the bed with a chair, and supporting it over the patient—the burning alcohol being set by the side of the bed, and so surrounded that the vapor can not escape.

Of all the measures to which we have resorted for the production of diaphoresis, the burning alcohol is the most efficient, if aided by the internal use of warm diaphoretic drinks. We care not how high the grade of inflammatory action, or how intense the fever, it will cause a copious perspiration, with a reduction of organic action, mitigation of the pain, heat of surface, and nervous disturbance, in a very short time. In cases attended with pungent heat of the surface, a dry or husky state of the skin, with a full and bounding pulse, great restlessness, and intense febrile or inflammatory action, it is much better to premise with cold ablutions for twenty or thirty minutes, before resorting to the use of the vapor bath. In acute or inflammatory rheumatism, and also in the chronic form of the disease, we know of no remedy of equal utility. It is much more stimulating to the surface than the aqueous vapor bath, even when both are applied at the same temperature, and hence is better calculated to relieve internal congestions. In sudden cold, suppressed perspiration, acute local inflammations —as pneumonia, pleuritis, hepatitis, enteritis, nephritis, etc.— in spasmodic action, violent painful affections, etc., it seems to relax the whole system, lessen organic action and the erythism of the nervous system, and induces copious perspiration. The advantages thus gained over diseased action, if maintained by other appropriate medication, can not fail, in thousands of instances, to put a speedy stop to the most formidable diseases in a few hours, without the use of the *lancet, calomel, or tartar emetic.*

It is obvious that this energetic course, and the production of such free and continued perspiration, would be highly detrimental, or even fatal to the patient, in the advanced stages of acute or chronic diseases, if great debility exists.

WARM VAPOR BATH.

This bath occupies an intermediate position between the warm air bath and the warm water bath. Vapor, to produce similar effects, requires a higher temperature than warm water, and not so high as warm air.

This may be applied by seating the patient on a chair over a kettle of boiling water, surrounding him loosely with a blanket, to prevent the escape of the vapor, and putting hot bricks, stones, etc., in the water, to keep up sufficient heat; or it may be applied by enveloping the patient in a blanket kept at some distance from the body, within which the vapor may be conducted by a tube leading from a closed vessel kept boiling by means of a spirit lamp; or the vapor may be conducted under the cover of the bed.

What is termed the *Medicated Vapor Bath* consists in impregnating the vapor with certain medicinal agents which may be supposed to exert a beneficial influence in removing the existing disease. The agent or agents used in this case are formed into a decoction, the vapor of which is used, or they are dissolved in the water used for the bath. Camphor, sulphur, and various gases, have been used in many cases as independent remedial agents in the form of a vapor bath.

As a therapeutic agent, warm vapor applied to the surface serves to soften and relax the cutaneous tissue, gently excite the capillary circulation of the surface, and produce copious sweating. It is more soothing and relaxing than the warm air bath, and possessed of greater power as a sudorific. It is employed in colds, sudden check of perspiration, and in the early stages of febrile and inflammatory excitement, when the surface is dry and constricted, with pain, restlessness, oppression, etc., either as principal or auxiliary means of producing perspiration. In almost every variety of febrile or inflammatory attack, it may be resorted to with a prospect of advantage, and also in many forms of chronic inflammation, rheumatism, and in many chronic cutaneous diseases. It has also been used with much advantage in amenorrhœa, dependent upon subacute inflammation of the uterus, especially when accompanied with a dry and harsh skin, and want of perspiration.

Topical or *Local Vapor Baths* are useful in local diseases, as painful inflammatory affections of the joints, rheumatism, gout, neuralgia, painful swellings, tumors, etc., and as an anodyne and soothing application to painful wounds, contusions, fractures, etc.

The *vapor douche* consists in directing a jet of aqueous vapor upon a particular part; it is really a topical vapor bath. It is employed in otalgia, otitis, otorrhœa, etc., by introducing the vapor into the ear through the orifice of a funnel inserted over a vessel of hot water. It may be applied to the genital organs, neck of the uterus, etc., in dysmenorrhœa, painful irritation or inflammation of the neck of the uterus or vagina, and likewise in many other painful local affections.

WARM WATER BATH.

The *tepid bath* consists in the immersion of the body in warm water at a temperature varying from 75° to 90°. It serves to cleanse the surface, equalize the circulation, allay thirst, relax the cutaneous emunctories, promote diaphoresis, and lessen organic action and the temperature of the body. It seems to act rather as a refrigerant and sedative, as is manifested by the languor, loss of muscular power, faintness, and somnolency, which soon follow the transitory excitement at first produced.

It is sometimes used in some of the acute phlegmasia, after other measures, but it is not to be relied on in the production of diaphoresis. When elevated to a higher temperature, or what may be termed a *hot bath*, it then becomes excitant, and proves serviceable in relieving congestions of internal organs, and in promoting the eruptive process in some of the exanthemata. The warm water bath is employed in chronic inflammations, spasmodic and convulsive diseases of children, amenorrhœa, dysmenorrhœa, etc.

The *Coxeluvium, Semicupium,* or *Hip Bath,* is employed in inflammatory or spasmodic affections of the pelvic viscera, amenorrhœa, dysmenorrhœa, spasm of the ureters or urethra, as in the irritation caused by the passage of urinary calculi, etc. It may aid indirectly in the production of diaphoresis, but it can not be depended on for this purpose.

The warm *Pediluvium,* or *Foot Bath,* favors diaphoresis by equalizing the circulation, lessening exalted action, and relaxing cutaneous constriction through a sympathetic influence. It is one of the most valuable adjuncts to internal diaphoretics, and as it is easily used, it is a favorite remedy both in domestic and professional practice.

Fomentations and *Poultices* act as topical baths, owing to the warmth and moisture which they contain. They thus serve to soften and relax the parts to which they are applied, and exert a sympathetic influence upon the entire system, which may result in diaphoresis.

COLD OR TEPID ABLUTIONS.

Cold or tepid ablutions, although they exert no direct agency when applied to the surface, in the production of perspiration, yet their indirect influence, in many instances, is of great importance. They act as refrigerants and sedatives; even if the ablution is tepid, the speedy evaporation which follows carries off the heat of the surface, and lessens capillary activity and even general vascular excitement, rendering them refrigerant and sedative.

Cold affusions, the cold *douche,* or cold immersion, all act in the same indirect manner in promoting perspiration. Their free and frequent application to the surface when it is hot, dry and constricted, and when accompanied by intense febrile and inflammatory excitement, serves to lessen the undue vascular excitement, cool and relax the skin, and promote diaphoresis. Their action, though indirect, is none the less important, and should never be overlooked by the physician in the cases referred to, as they are among the most powerful auxiliary measures to which he can resort to reduce exalted vital action, and induce perspiration. (See Refrigerants.)

COLD WET-SHEET PACK.

This is one of the most powerful means of inducing diaphoresis with which we are acquainted. It is especially applicable in febrile and inflammatory diseases, as well as in some chronic affections. In high grades of fever, when the skin is hot, dry, and constricted, its use is pleasant to the patient, cooling the surface, relaxing the skin, subduing nervous irritation, and producing profuse sweating. The personal experience of a physician may illustrate its use and action. Some years ago he caught a severe cold from exposure, perspiration was entirely checked, and he had alternate chills and flushes of fever. There was also such a degree of pain in the back and limbs, and general nervous irritability, that he could not sleep for two nights preceding. He made up his mind that as he did not like to be sick, and had an aversion to swallowing his own medicine, he would take the wet-sheet pack. (Family opposed, said it would be certain to kill him.) The sheet was wrung out of cold water, and laid upon a blanket which covered the bed, and upon this our doctor got, and it was well tucked in around him, putting as many extra blankets above as he could well bear. For the first five minutes it was one continued chill, shaking as badly as ever man did with the ague; but after this it soon grew pleasant, the pain ceased, and in less than fifteen minutes he was sound asleep, and slept comfortably for two hours, the first he had had for two days. Upon awaking he was in a profuse perspiration, and was told he had been so since he went to sleep, and what was better, the disease had entirely left him, and did not re-appear.

We have tried this means of producing diaphoresis in many cases, such as has been named, and always with the most beneficial effects; we would, therefore, strongly recommend it to the notice of the profession. Objections are frequently made to its use by patients, who can not understand why we should wish to put them in cold water, when probably the disease originated from what they supposed a somewhat similar exposure. These objections, however, are removed after one or two in a community have experienced its beneficial effects.

HOT BLANKET PACK.

When the circulation is feeble, a blanket may be wrung out of hot water and applied as the ordinary wet-sheet pack. It is especially indicated when the temperature is low, and the skin atonic.

HOT SPONGE BATH.

In the same conditions we employ water as hot as it can be borne, by sponging the surface rapidly. A small part should be taken at a time, rapidly dried, and covered with flannel.

FRICTION.

Friction of the surface with a flesh-brush or dry flannels, serves to excite the cutaneous exhalants to increased activity, and favors the production of diaphoresis. It is usually employed with ablutions and baths, as an additional measure, and not as an independent therapeutic agent. It will be found advantageous in many chronic diseases, local dropsies, indolent tumors, chronic swellings, indurations, etc., as a means of producing revulsion.

CLASS IV.

DIURETICS.

Diuretics are those agents which, acting on the kidneys, promote the secretion of urine. The renal secretion is one of the most important depurants in the body, removing in twenty-four hours, in health, from 600 to 700 grains of solid matter. This material is the product of the disintegration of the nitrogenized tissues of our bodies, and is so constituted that it can not be retained without producing disease. Such agents then, as will restore this secretion when diminished or suppressed, or that in certain states of the system will greatly increase it, can not but be regarded as among our most valuable means of removing disease.

The kidneys differ from all other secretory organs in being adapted to perform two entirely separate and distinct functions; this adaptation being manifested by their anatomical structure. These functions are the excretion or pumping off of the excess of water from the blood, and removing from the blood certain nitrogenized matters, the products of the waste of the tissues. The first merely relieves vascular turgescence, while the second is depurative, removing morbid matters from the blood.

The solids of the urine constituting its proper secretion, are *urea*, *uric acid*, *creatine*, *creatinine*, *hippuric* and *lactic acid*, and the soluble salts.

Urea forms the largest amount of the solids of the urine; 270 grains, or more than half an ounce, being excreted by a healthy adult in twenty-four hours. Its chemical formula is C_2, N_2, H_4, O_2. This is a highly nitrogenized compound, and constitutes the form under which a large quantity of nitrogen is expelled from the system. Urea is produced by the disintegration of the worn-out tissues of the body; it contains as much as five-sixths of the nitrogen taken into the body, and it constitutes the mode by which the largest portion of nitrogen is removed from the body. Dr. Golding Bird states, that "Its origin must be traced to the destructive assimilation of those tissues of the body which are removed to make room for new matter. Minute quantities of urea escape from the system by the skin, but this body is removed so rapidly from the blood by the kidneys, that very minute traces of it only can be obtained, unless these organs become diseased, and are then no longer fitted to perform their important functions of depuration."

The effects produced by the retention of this element in the blood, from defective secretion of the kidneys, is well shown by the experiments of Prevost and Dumas. They extirpated the kidneys of dogs; on the third day after the operation, vomiting commenced, there was diarrhea of a copious brown liquid, fever, with heat varying as high as 110°, and sometimes as low as 92°; pulse very small and frequent, breathing labored, death ensued from the fifth to the ninth day. After death there was found effusion of serum in the brain, copious mucus in the bronchia; the liver was inflamed, and the bladder much contracted; the blood was more watery than natural, and contained urea, five ounces of the blood of a dog yielding twenty grains of urea. The symptoms appearing in man from retention of urine are obstinate vomiting, diarrhea, typhoid symptoms, low muttering delirium, epileptic convulsions, coma, etc. All these effects, says Dr. Williams, may be traced to excrementitious matters being retained in the blood, especially *urea*, which has, in very many instances, been detected in considerable quantities—in the greatest amount acting on the system as a narcotic poison; in smaller, acting as an irritant, inducing low inflammations in various membranes and viscera; and in a still lower degree causing sundry functional disorders, fluxes and dropsies, impoverishing the blood, and inducing degeneration of certain textures.

Uric acid, *creatine* and *creatinine*, are substances similar to urea; that is, highly nitrogenized bodies. Like urea they are excrementitious substances, the product of the waste of the tissues; their amount is small compared with urea, but they are probably as deleterious to the system, according to their quantity, as that body. *Hippuric acid* is also a small constituent of the urine of man, and not always present. It differs from the others in containing but a small proportion of nitrogen, and is probably formed by the disintegration of the carbonaceous tissues.

From what has been stated above, it will readily be seen that this is one of the most important excretions of the body. Through the kidneys we have eliminated a large amount of the excrementitious materials formed by the disintegration of the nitrogenized tissues of the body; and it has been satisfactorily proved that the materials thus excreted, if retained, will act as a most virulent poison on the system. If this excretion is, then, so important in health, what must it be in disease, when disintegration of the tissues of the body is actively going on? And what benefit must be derived from such agents as will promote their elimination?

Action of Diuretics.—Diuretics are absorbed into the circulation, and act directly upon the secernent structure of the kidneys, as is evident from the reappearance of those substances in the urine. The same agents, if injected into the bloodvessels, will exert a similar influence upon the renal secretion. To those agents which increase the secretion of urine, whether taken into the stomach or absorbed from any other portion of the system, or injected into the veins, in suitable quantities, the term *direct diuretics* is appropriate, and to those agents it is frequently, and should be exclusively applied.

Other agents may exert an indirect influence over the urinary secretion, as diluents, by causing vascular repletion, and thereby causing an increased action of the kidneys to remove the water. Cold applied to the surface lessens the amount of the cutaneous secretion, and thereby imposes an additional burden upon the kidneys, and when they are able to perform this function, increased diuresis follows. Cathartics sometimes greatly increase the amount of this secretion, by removing congestion of the kidneys, by producing revulsion to the bowels, etc. In consequence of these and other agents promoting diuresis by these indirect influences, they may be termed *indirect diuretics.*

Those agents only should be named diuretics, which act directly on the kidneys, and stimulate them to increased action, and not those which act on some other organ first, and subsequently exert an indirect influence on the kidneys.

Some of the direct diuretics merely increase the water of the urine, without a proportionate increase of the solid constituents; to these Dr. Golding Bird gives the name of *renal hydragogues.* Though this class of agents greatly increase the fluid portions of the urine, and thus diminish its specific gravity, yet it is found that the solids are increased, though not proportionately; the excess of water washing away but a small additional amount.

Others, having a direct chemical action upon the body, greatly increase the amount of the solids, either with or without a proportional increase of the entire amount of the urine. To these Dr. Bird gives the name of *renal depurants.*

In regard to the action of the *renal hydragogues*, Dr. Bird lays down the following proposition: "Remedies which exert no chemical action on organic matter out of the body, appear to be incapable of augmenting the quantity of solids in the urine, and hence are only of use in increasing the elimination of water—they may and do act as renal hydragogues, but not as renal depurants." In proof of this proposition, we may adduce the following table, calculated by Dr. Bird, from Krahmer's observations:

Medicines given.	Solids in the urine of 24 hours.	Combustible (animal) matter in.	Saline matters in.
None, - - -	2.40 ounces.	1.28 ounces.	1.13 ounces.
Juniper, - -	2.12 "	0.94 "	1.18 '
Venice Turpentine,	1.94 "	1.11 "	0.83 "
Squills, - -	2.25 "	1.04 "	1.21 "
Digitalis, - -	2.45 "	1.28 "	1.17 "
Guiac, - -	2.43 "	1.38 "	1.05 "
Colchicum, - -	2.32 "	1.36 "	0.96 "

Renal depurants, though they generally increase the amount of urine passed, greatly increase the solid constituents of it. This they do, not only by stimulating the proper secretory apparatus of the kidney, but by increasing the metamorphosis of tissue within the body. The agents composing this class all exert a chemical influence upon dead animal matter, and when absorbed, they tend to break down all the imperfectly organized tissue, and by their direct action upon the kidneys they cause it to be excreted. This class of agents embraces the alkalies, the carbonates and their salts, with such acids as in the animal economy are capable of being converted into carbonic acid, including the acetates, citrates, and tartrates of soda and potassa. In regard to their action we may adduce the following example from Dr. Bird:

	Without Medicine.	After ʒiij. pot. acet.
Quantity of urine in twenty-four hours,	f ℥xvj.	f ℥xlvj.
Specific gravity of, - - -	1.025.	1.017.
Solids in, - - - -	416 grs.	782 grs.

The reason why, probably, this class of diuretics is not held in greater repute by many practitioners is, that in fevers and other acute diseases, attended with increased metamorphosis of tissue, the vegetable *hydragogue diuretics* are administered instead of the true *renal depurants.* We are satisfied that this is the fact, and would call the attention of the reader especially to this latter class. In the diseases just named the worn-out and exhausted tissues, floating in the blood, become a constant source of disease; in many instances we may assume that it is *the disease*—they are, however, in such a condition as not to be readily excreted. Now, it is a well known fact, that the alkalies break up these into various secondary products, even without the body, and we may readily suppose that the change that takes place in the circulation is such as to fit the worn-out tissues for excretion.

Dr. Bird makes the following highly interesting observations upon the case given above, in which the acetate of potash was given, and upon the use of diuretics: he says, "The results of these analyses show that, after deducting the excess in the amount of soluble salts, arising from the conversion of acetate of potassa into carbonate in its transit from the stomach to the kidneys, the solids of the urine, separated from the blood under the influence of the chemical diuretics, exceeded those excreted without its aid by one hundred and ninety grains. We further learn that, although a large proportion of matter was metamorphosed into both uric acid and urea, after the administration of the acetate, still that the greatest increase was in that mixture of organic products set down as *extractive*, and which, as we have seen, consisted chiefly of creatine, creatinine, uroxanthin, and matter rich in sulphur. In the example adduced, not only did the patient lose an excess of thirty ounces of water in twenty-four hours, but she wasted to an extent of one hundred and ninety grains more than if no remedy had been given; and to this extent had the blood been depurated of those elements which yielded easiest to the influence of the alkaline salt. As it can not be denied, that vital force is ever active in opposing the chemical changes to which all living fibers are obnoxious, it is fair to assume that this resistance will increase with the vital endowments of a part; or, in other words, that the elements of our frames resist chemical influences in the ratio of their vitality; it would follow that such constituents of our bodies as present the greatest departure from health, are less highly vitalized, and thus would be expected to yield the easiest to the influence exerted by the alkaline diuretics, or renal depurants. As a result of this view, we should expect that when we cause an alkaline carbonate to circulate through the blood, it exerts an influence on the nascent elements of those matters less highly influenced by life, resembling that which it exerts on dead matter, aiding their resolution into substances allied to those produced out of the body, and actually causes the matter to assume so soluble a form as to allow of its ready excretion. This remarkable effect of the alkaline diuretics (although now *demonstrated* by actual experiment, and the results of their chemical influence detected in the stream by which they are washed from the body) was not overlooked by the observing physicians of former years. It was, indeed, acted upon by the old physicians—witness the host of apozems, diuretic decoctions, and diet-drinks, in which renal stimulants abound; and let us not shut our eyes to the success of the practice; for unless we deny all credence to the statements of the painstaking practitioners of past times, those who will read their quaint records of cases, will learn how generally they succeeded in curing the effects of a *caco-æmia*, an unhealthy blood, as evidenced in various eruptive affections, cellular membranous sores, furunculi, and very many such ailments. It is true, that in looking at some of their prescriptions we do not generally observe remedies which have now much confidence placed in them as trustworthy diuretics; but then an important element of their potions is, most undoubtedly, the water of the decoction employed, not in doses of tablespoonfuls, but as was common in former days, of pints. A most important truth here demands our attention. It may be said, that it is true that if a patient takes a pint or two extra of water he will, supposing that no organic lesion exists, excrete a large bulk of urine from the necessity there exists for pumping off the excess of diluent partaken of. In this way a pint or two of water becomes a diuretic: this every one's experience will enable him to admit; but what is this, it may be asked, but the mere drawing off of excess of water—where is the proof of blood-depuration? This proof is afforded by calculating the amount of solid constituents of the urine. It will then be found that the excess of water does not escape alone, but there is really washed away with it, a certain, although not very large, quantity of solid debris."

THERAPEUTIC INDICATIONS.

I. *Action in Febrile and Inflammatory Diseases.*—In all febrile diseases, there exists generally a torpor of the excretory organs, and hence the metamorphosed tissues—the worn-out materials of the system—are not eliminated, but remain in the circulation. We have also mentioned the fact in a previous part of this work, that fever in a majority of cases is caused by, either the retention of an excretion, which acts as a foreign matter,—a ferment in the blood,—or by the introduction of such a material into the circulation from without. In either case the decaying matter while in the circulation, acts as a ferment, transmitting its decomposing tendencies to every portion of the blood that is not sufficiently vitalized to resist this chemical influence. If such is the case, and we believe it is well substantiated, we can plainly see the beneficial effects that would follow the use of such agents as would cause the elimination of an ounce and a quarter of this excrementitious matter every twenty-four hours.

Renal depuratives are then indicated in all febrile diseases, for their eliminative action. They not only stimulate the kidneys to normal action, removing such material as is already fitted for excretion, but by their chemical action while in the circulation, they so change the less vitalized portion of the circulating fluid that it is also excreted. The alkalies and their salts, which form the principal agents of this class, also act as refrigerants, lessening the heat of the body. When we wish to produce this effect, we administer a salt of some of the organic acids, the acetates, citrates, etc: this salt in its passage through the blood to the kidneys, is converted into a carbonate. In order to convert one equivalent of such a salt (for instance the acetate of potash), into a carbonate, eight equivalents of oxygen must combine with it. This oxygen, therefore, which is appropriated by the diuretic, is abstracted from the amount which would have acted upon the tissues of the body, and not only is there a less amount of heat generated, but there is also a marked decrease in the waste of the tissues, owing to the fact that the remedy has appropriated oxygen, which otherwise would have acted directly upon them. We have therefore four effects from such a salt: first, it stimulates the kidneys and causes an elimination of such material as may readily be excreted by them; second, it so changes those parts having a low degree of vitality that they are fit material for excretion; third, by appropriating oxygen to form a carbonate it proves refrigerant; and lastly, it diminishes the production of effete matters — the breaking down of the tissues by presenting their oxygenation.

In sthenic fevers they act as antiphlogistics, that is, according to many eminent authorities, they have the power of diminishing the amount of fibrine in the blood. Guliver has also noticed that they counteract the tendency of the blood-corpuscles to become aggregated in rows, a tendency especially observed in inflammation; and by diminishing the amount of the serum, they lessen vascular repletion.

In asthenic or typhoid fever, they indirectly increase the strength of the patient, by removing the materies morbi, which so depresses the vital powers, and especially the brain and nervous system; and may not the change which they effect in such material, even if it is not excreted, prevent its acting as a ferment in the blood?

Dr. Golding Bird states that he has found them of great value in remittent and intermittent fevers; though they are not antiperiodic, yet he believes they will effect that which quinine and its allies can not do. He says: "When to a person suffering from the effects of marsh malaria, acetate of potash has been administered to the extent of ʒij. in the course of twenty-four hours, largely diluted, and continued for two or three weeks; not only is no injury effected by the remedy, but the most marked benefits are observed to result The patient's skin becomes less dusky, the expression more healthy, the dull aspect of the eyes changed for one of cheerfulness, the engorgement of liver and spleen lessens, and the paroxysms of 'dumb ague' disappear."

The vegetable *hydragogue* diuretics are also useful in these diseases, and especially is this the case when they are given in infusion or decoction. The diuretic agent stimulates the kidneys to remove the serum of the blood, and thus the vessels are depleted, while the water of the decoction or infusion acts as a depurant, washing away some of the detritus of the system. They are, however, comparatively unimportant agents, in these diseases, so far as their diuretic properties are concerned; but many of them exert other influences upon the system, which may be beneficial.

II. *Action in Rheumatism.*—The class of diuretics termed *renal depurants*, are among our most valuable agents in the treatment of rheumatism. In several instances we have witnessed the beneficial action of the acetate, or nitrate of potassa, in these cases, with surprise. We have seen the severe symptoms disappear in twenty-four hours, and in a few days the patients would be well. This, however, is not invariably the case; for we have also known instances where, unless they were combined with other agents, they produced no effect. In such cases, however, a combination that will effect both the cutaneous and renal excretions, as the combination named under the head of diaphoretics (eupatorium perfoliatum, asclepias tuberosa, sanguinaria canadensis and nitrate of potassa), we have never known to fail, if properly carried out.

Dr. Golding Bird strongly recommends the acetate of potassa in this disease; and the success of his treatment, in the wards of the London Hospital, would go to prove that he has not overestimated its value. In regard to its use, he says: "I would not willingly use language which was not completely compatible with experience; but I do not still hesitate to declare that I have never seen the disease in question yield with so much facility to any other remedy. In the severest cases which have been admitted into the hospital under my care (and I prefer alluding to them rather than to cases in private practice, as they have the advantage of being watched by many, and less chance of error arising in the reports of the progress of the patients), I have seen the cure to be more rapid, and the immediate relief to the patient more marked by the use of the acetate of potassa, in quantities of half an ounce, administered, largely diluted, in divided doses, in twenty-four hours, than by any other treatment. In three days I have repeatedly found the exquisite pain of the joints nearly absent, the patient comparatively comfortable, and able to bear with greater ease the helpless state in which the still swollen joints place him. In no case has any ill effect followed the use of the remedy, and while the cure has been far more expeditious, the ill effects of colchicum and mercury have been avoided. The pain remarkably and suddenly lessens, as soon as the urine becomes alkaline, and rises in specific gravity."

In chronic rheumatism, these agents are also very valuable. Whenever they produce a marked increase of the solids of the urine, the disease yields to their use. The beneficial effects of the iodide of potassium, is, probably, due to a greater extent than is supposed, to the diuretic properties of this salt. In two cases particularly noticed by us, where this agent proved beneficial, it acted as a diuretic, the solids of the urine being much increased; and in other cases we have derived similar benefit from other salts of potassa.

III. *Action in Chronic Diseases.*—In chronic disease, where there is evidence of an unhealthy state of the blood, the class of renal depurants will be found highly beneficial. They may be truly called *alteratives* in many cases; that is, they remove the vitiated materials circulating in the blood, and thus promote digestion, assimilation and nutrition. We have seen the habitually coated tongue, the sallow skin, cutaneous eruptions, foul stomach, etc., disappear under their use. when tonics and restoratives had proved of no avail

And may we not ask, is not the beneficial effect of our compound sirup of stillingia and iodide of potassium, so frequently used in such cases, partly due to their acting as renal depurants? We have noticed under their employment an increased amount of the solids of the urine, which would tend to prove it.

IV. *Action in Dropsy.*—As we have already given a some what extended account of the action of diuretics in this dis ease, under the head of cathartics, a short notice will suffic here. The class of diuretics principally used in dropsy are those termed *renal hydragogues*, or those that increase the fluid portions of the urine: of these some are topical stimulants to the kidneys, others to the entire system, while still another class are sedatives. They prove curative in two ways: first, by removing the serum of the blood, and second, by their derivative influence.

All diuretics decrease the fluid portions of the blood, and thus they not only lessen the amount of fluid circulating in the vessels, but they also destroy the balance existing between the solids and fluids of the blood. We have already referred to the law that when a portion of the circulating fluid was abstracted, absorption through the veins became active, in order to replace the amount so removed. If no fluids are ingested to replenish this loss, absorption will take place from any fluid that has been effused; and this dropsical effusion will be taken to supply the amount of serum abstracted.

Undoubtedly much advantage is often secured by the derivative influence of diuretics, particularly those of an exciting character. They stimulate the kidneys to increased activity, and render these organs the center of fluxion to which the circulating fluids are directed in increased quantities, and from which the serum is abstracted by the increased activity of these organs. While this local derivative action continues, the vessels implicated in the diseased action, and from which the serous exhalation or dropsical effusion is taking place, are relieved of their burden, and allowed an opportunity of recovering their tone. This point is no longer the center of fluxion, or, at least, it is only so in a diminished degree; consequently, the effusion ceases, or becomes diminished in proportion to the action of the renal stimulant.

The sedative diuretics are indicated in sthenic habits, or whenever there is dropsical effusion attended with vascular activity; they are contraïndicated when the habit is asthenic, as when the dropsy is of a passive character, the stimulant diuretics are required.

It must be borne in mind that hydragogue cathartics are of primary importance in all cases of dropsy, while diuretics are but secondary, though important; and this is especially true in dropsies arising from indurations or visceral engorgements of any kind. In such cases hydragogue and deobstruent cathartics are not only important therapeutic agents, but they are indispensable to success.

V. *Action in Diseases of the Urinary Organs.*—In diseases of the urinary organs they become the most efficient agents at our command. In acute inflammation of any portion of the urinary apparatus, refrigerant and demulcent diuretics are of the first importance; they increase the quantity of the urine, and being excreted with it, they lessen its acrid character, and lessen its irritant action upon the inflamed tissues. In chronic inflammation, catarrhal affections, or in cases of ulceration of the mucous membrane of the urinary passages, the balsamic diuretics are demanded; these agents probably act as direct local stimulants, and by the new action which they set up, the morbid process is relieved. The tonic and astringent diuretics, as the uva ursi, pipsissewa, buchu, etc., often prove highly valuable in the same cases. They are also used in diabetes, in conjunction with other agents, with decided advantage. The same class of agents are often employed in combination with the mineral acids, in cases of phosphatic deposits, and with alkalies in cases where the lithates are in excess. In these diseases they seem to act by medicating the urine, which comes in direct contact with the diseased tissue, and in this way they act as topical remedies. The balsam of copaiba, cubebs, etc., probably owe a portion of their virtue in the cure of gonorrhea to their impregnating the urine with their medicinal properties, and being thus brought into direct contact with the inflamed mucous surface.

RECAPITULATION.

1st. Diuretics are useful in any disease in which ther a diminution or suppression of urine; in such cases t stimulate the kidneys to normal action, and thus pron the elimination of the normal constituents of the urine.

2d. A certain class of them greatly increase the solid the urine, not only by causing an elimination of such terials as are already fitted for excretion, but also, as suppose, by so changing the less vitalized material as to mit its elimination.

3d. The alkaline diuretics not only increase the solid of the urine, and thus prove eliminative, but they also ac refrigerants, and to some degree prevent the disintegra of the tissues of the body, by combining with a portion the oxygen in the circulation.

4th. They promote the absorption of dropsical effusi by lessening the quantity of the circulating fluid, and destroying the balance between the solids and fluids of blood—absorption being active in proportion to the dimi tion of serum in the vessels.

5th. They act as counter-irritants, causing the format of a new point of excitement and fluxion, by which me other parts are relieved.

6th. They act topically in diseases of the urinary orga their virtues being in part transmitted to the urine, they brought into direct contact with the diseased tissue.

7th. They augment the elimination of water, and t enable the urine to hold in suspension any material requir much of this fluid to hold it in solution. They also act solvents in calculous affections; but most probably thi only in proportion to the amount of water excreted—wa according to the best authorities, being the best solvent "stone."

EUPATORIUM.

THE ROOT OF EUPATORIUM PURPUREUM.

Dose.—The Eupatorium Purpureum is mostly employed in the form of a strong decoction, ℥j. to Oiss. of water, boiled down to one pint, of which one to four ounces is a dose. The tincture can be used with advantage in ordinary practice, and will give good results in small doses.

Therapeutic Action.—Queen of the Meadow is diuretic, stimulant, astringent, tonic, and antilithic. There is no doubt that this agent exerts a specific influence upon the kidneys, increasing the quantity of urine secreted, and to some degree the amount of solids excreted in it. From the combination of properties which it possesses, its utility in urinary affections will be readily inferred. It has been employed in atonic dropsies, chronic nephritis, catarrhous vesicæ attended with ulceration, chronic irritation of the bladder with increased mucous secretion, etc. It has also been employed in hematuria, gleet, leucorrhœa, amenorrhœa, and other forms of female weakness, rheumatism and gout, with complete success.

It is a popular remedy in gravel, and indeed said by some to possess solvent powers; although we can not award it any positive powers of that kind, yet, as it increases the amount of water excreted, which is acknowledged to be the best solvent for stone, and allays irritation of the bladder, we must consider it as at least the equal of Uva Ursi and Chimaphila, and useful where those agents are usually thought to be available. It is associated with the root of the horse-radish, juniper berries, and other diuretics, in dropsy; and with the buchu, pipsissewa, uva ursi, etc., in chronic affections of the kidneys, bladder, urethra, etc., when attendant with a redundant mucous discharge.

Eupurpurin, when carefully prepared, is one of the most reliable of our concentrated remedies, producing, so far as our experience has extended, all the medicinal effects of the crude root. We frequently administer it in the pill form, one drachm of the article being rubbed up with prussiate of iron, until it has sufficient consistence to form pills, and divide it into thirty. These pills we have used as a diuretic in dropsy, with suitable cathartics, with the most satisfactory results, and this is especially the case when the patient is greatly debilitated. They are also among our most efficient curative agents in diseases of the kidneys, bladder, and urethra. In one case of marked albuminuria, where other agents had failed to produce any relief, the continued use of these pills, one three times per day for two weeks, entirely relieved the patient. In two cases of diabetes insipidus, their use was attended with the same results. We have also employed them in incontinence of urine, especially in children, with good effect. They are of the most importance, however, in allaying irritation of the bladder; in many cases of this kind, caused by displacement or chronic inflammation of the uterus, or arising during or after pregnancy, we have obtained more benefit from their use than from any other agents. From experience, then, we can recommend this preparation to the favorable notice of the practitioner.

SCOPARIUS.

THE TOPS OF CYTISUS SCOPARIUS.

Dose.—Of an infusion of one ounce to a pint of boiling water, one to two ounces. Of a decoction of one ounce to a pint and a half of water, boiled down to a pint, one to one and a half ounces.

Therapeutic Action.— Scoparius is diuretic, laxative, tonic, and in large doses emetic and cathartic. Mead and Cullom recommend it strongly for its diuretic properties. Pereira speaks of it as a powerful diuretic, and says: "I can not call to mind a single case in which it has failed to act upon the kidneys. In some cases it produces a most marked and beneficial effect upon the dropsical effusion. According to my experience it is more certain than any other diuretic in dropsies."

BUCHU.

THE LEAVES OF DIOSMA CRENATA.—Cape of Good Hope.

Preparations.—An infusion of the leaves. Tincture of Buchu.

Dose.—Of an infusion, ℥j. Of the tincture, gtt. x. to ʒj.

Therapeutic Action.—Buchu is diuretic, stimulant, tonic, and diaphoretic. It exerts a specific influence upon the urinary organs; while by its tonic, stimulant, aromatic, and diaphoretic qualities, it promotes the appetite, relieves flatulence, and favors diaphoresis. The volatile oil furnished by the leaves of the Buchu is absorbed into the circulation, and communicates its odor to the excretions shortly after it is taken.

In Europe and in this country Buchu has been mostly administered in disordered states of the urino-genital organs. It is especially appropriate in chronic affections attended with copious secretion. In cystorrhœa, attended with profuse secretion, it often checks it and lessens the irritable condition of the bladder, thereby enabling the patient to retain his urine longer.

CHIMAPHILA.

THE HERB OF CHIMAPHILA UMBELLATA.

Preparations.—A decoction. Tincture of Chimaphila.

Dose.—Of the decoction ℥j. Of the tincture gtt. x. to ʒj.

Therapeutic Action.—Chimaphila is diuretic, tonic, astringent and diaphoretic, and said by some authors to be alterative. It exercises a specific influence over the urinary apparatus, increasing the renal secretion, and at the same time it is thought by some to lessen the quantity of lithic acid or lithates secreted. It is especially serviceable in chronic diseases of the genito-urinary mucous membrane, as in chronic catarrhal affections of the bladder, chronic nephritis, or urethritis attended with purulent or profuse mucous discharge. It is also beneficial in calculous and prostatic affections, diabetes, in the advanced stages of albuminuria, and in other disorders of the urinary organs attended with local debility, or chronic irritation or inflammation. Its utility in the affections named, may undoubtedly be ascribed in part to its astringent and alterative action, and in part to its diuretic and tonic properties.

Chimaphilin, the concentrated principle of the Chimaphila umbellata, is a light yellowish-brown powder, having a faint, not disagreeable odor, and a feeble taste. It is mildly diuretic, and is especially indicated where there is debility of the urinary organs, and a tonic is desirable. As an alterative it is highly recommended by some in the treatment of scrofula.

It is also said to be an efficient remedy in the treatment of chronic rheumatism. Dose grs. ij. to grs. v.

UVA URSI.

THE LEAVES OF ARCTOSTAPHYLOS UVA URSI.—EUROPE, AMERICA.

PREPARATIONS.—A decoction. Tincture of Uva Ursi.

DOSE.—The dose of a decoction will be one tablespoonful. Of the tincture gtt. x. to ʒj.

THERAPEUTIC ACTION.—Uva Ursi is diuretic, astringent, tonic and antilithic. Although it is not an active diuretic and indeed acts feebly as such, yet from its specific action upon the urinary apparatus, an action not exerted by any other vegetable astringent, we have thought it proper to consider the agent in this place. The benefit derived from its use in the diseases to which it is specially applicable, is due, no doubt, in great part to its astringent and tonic influence upon the kidneys and mucous membrane of the urinary organs.

It is a popular remedy in chronic nephritis, and ulceration of any part of the urinary passages; also in diabetes, catarrhus vesicæ, incontinence of urine, leucorrhœa, gleet, menorrhagia, and other diseases of the mucous surfaces attended with a redundant mucous secretion, and accompanied with either local or general debility.

JUNIPERUS.

THE TOPS, BERRIES AND OIL OF JUNIPERUS COMMUNIS.

PREPARATIONS.—An infusion. Tincture of Juniper. Oil of Juniper.

DOSE.—Of the infusion ʒj. to ℥j. Of the tincture gtt. x. to ℥ss. Of the oil gtt. ij. to gtt. v.

THERAPEUTIC ACTION.—Juniper is diuretic, stimulant, carminative, emmenagogue, diaphoretic. The berries and tops exert an influence upon the system analogous to the turpentine's. The berries act specifically upon the urinary organs, imparting a violet odor to the urine. Taken too freely, they cause irritation of the bladder and heat in the urinary passages; Pisa asserts that their continued use produces bloody urine. They act upon the skin, relieve flatulence, and promote the catamenia. The foregoing effects depend upon the presence of the volatile oil which they contain, which, according to the experiments of Alexander, when exhibited in doses of four drops, is one of the most powerful diaphoretics.

Oil of juniper is diuretic, carminative and diaphoretic, and may be administered to fulfill the same indications as the infusion of the berries.

PETROSELINUM.

THE ROOT OF APIUM PETROSELINUM.

Therapeutic Action.—Parsley root is a mild, unirritating diuretic, especially adapted to irritated and inflamed states of the urinary apparatus, as in gonorrhœa, cystitis, nephritis, urethritis, and in the painful micturition caused by displacement of the uterus. It augments the flow of urine, and by increasing its quantity lessens its acridity, thus affording much relief in the diseases named. It is also employed advantageously in hydropic affections, but as an independent article in these cases it is not to be relied upon.

CUCURBITA.

THE SEEDS OF CUCURBITA CITRULLUS, CUCURBITA PEPO.

Therapeutic Action.—The seeds of both the watermelon and pumpkin are esteemed useful for their diuretic qualities. They are simple, mild and unirritating, and often of great service in cases of strangury, ardor-urinæ of gonorrhœa, suppression of urine, and irritated and inflamed states of the urinary organs generally. They may be employed either alone, or combined with other diuretics, as parsley, cleavers, etc.

The pulp of watermelon is refrigerant, diluent, and diuretic, and both admissible and useful, if taken with due restrictions, in febrile and inflammatory disease.

VERBASCUM.

THE LEAVES AND FLOWERS OF VERBASCUM THAPSUS.

Therapeutic Action.—Verbascum is diuretic, demulcent, emmollient, pectoral, diaphoretic, and is said to be antispasmodic and alterative. A decoction of the leaves acts upon the urinary organs, promoting an increased secretion of urine.

It is a mild and simple diuretic, well calculated to relieve irritation and inflammation of the genito urinary mucous membrane. Gonorrhœa, dysuria, suppression of urine, etc., are much benefitted by its use.

The leaves and pith are employed externally, made into fomentations and cataplasms, in cases of white swelling, hemorrhoids, indurated glands, and other inflammatory swellings. The pith is regarded as an important ingredient in the fomentation recommended in Beach's Practice, in cases of hydrarthrus.

ALTHÆA.

THE ROOT OF ALTHÆA OFFICINALIS.

Therapeutic Action.—Marsh Mallows is diuretic and demulcent. As a diuretic it may be employed in nephritis, cystitis, or other inflammatory affections of the urinary organs. It increases the secretion of urine, and exerts its demulcent influence upon all parts of the urinary mucous membrane. We have administered it with much success in acute cystitis, and to relieve the ardor-urinæ of gonorrhœa. It is also a favorite remedy in strangury especially when caused by the action of cantharides. It is employed with advantage as a demulcent in inflammation of the fauces, tonsils, throat, and upper part of the larynx, and in coughs, hoarseness, etc.

GALIUM.

THE HERB GALIUM APARINE.

Therapeutic Action.—Cleavers is said to be diuretic, aperient, refrigerant and antiscorbutic. It may be used with much advantage in acute nephritis, cystitis and gonorrhœa, as it is refrigerant, lessening the irritation and inflammation of the affected parts, and diminishing the acridity of the urine. It should not be used, however, in torpid and debilitated states of these organs. It has been used with benefit as a diuretic and refrigerant drink, in acute febrile and inflammatory diseases, almost invariably increasing the flow of urine; it has the advantage of agreeing well with the stomach.

The other species of Galium possess similar virtues, and may be substituted for this.

ASPARAGUS.

THE ROOTS AND YOUNG SHOOTS OF ASPARAGUS OFFICINALIS.

Therapeutic Action.—Asparagus is considered to be diuretic, aperient, deobstruent and sedative. A decoction of the roots or young shoots seems to augment the flow of urine without exciting the action of any other part. It is a very mild and unirritating diuretic, and may therefore be used in inflammation or irritation of the kidneys, bladder or urethra. Aperient and deobstruent properties are ascribed to it, and at one time it was exhibited as an alterative and purifier of the blood.

CAROTA.

THE ROOT AND SEEDS OF DAUCUS CAROTA.

Therapeutic Action.—Wild Carrot is diuretic, excitant, aromatic and carminative. The seeds are diuretic, stimulant, aromatic and carminative, and are used in nephritic diseases, gravel, irritation and inflammation of the bladder and urethra, suppression of urine, dysuria from blisters and other causes, gonorrhœa, dropsy, etc.

The dose of the pulverized seed is from half a drachm to one drachm, or one ounce of the bruised seed may be added to one pint of boiling water, and the whole taken in the course of the day. The root is used in the form of a decoction in painful micturition, inflammatory diseases of the urino-genital orans, and sometimes in dropsy. Its properties are analogous in every respect to those of the seeds.

The root of the *common garden carrot* is in much repute as a cataplasm in cases of phagedenic, ill-conditioned and indolent ulcers, chapped nipples, and as an application in the ulcerated stage of cancer. It is somewhat stimulant, and changes the diseased action of the ulcerated surface, corrects the fetor, allays the pain, and often proves eminently beneficial. The poultice is formed by scraping or grating the root, and mixing it with water. The boiled and mashed root acts simply as an emollient poultice, and is useful in cases of burns, painful tumors and inflamed surfaces.

EPIGEA.

THE LEAVES OF EPIGEA REPENS.

Therapeutic Action.—Epigea is diuretic, astringent, and said to be tonic and antilithic. It is esteemed a very useful diuretic, and has been employed successfully in gravel, suppression of urine, dropsy, etc. It appears to be more especially adapted to the relief of chronic affections of the urinary organs attended with an increased secretion of mucus, or with a discharge of purulent matter, as in catarrhus vesica, or in cases where a suppurative action is going on in the kidneys, bladder, or urethra; consequently, it is to be classified with the tonic or astringent diuretics, as the uva ursi, chimaphila, etc., though it is superior to either of these.

VACCINUM.

THE LEAVES OF VACCINUM FRONDOSUM.

Therapeutic Action.—Vaccinum is diuretic, tonic and astringent. The leaves possess decided diuretic properties, and as such are used in dropsical affections, especially when accompanied with great debility. They, like the preceding article, are adapted to that class of urinary affections attended with chronic irritation or inflammation and a profuse mucous or purulent discharge; they are also recommended in calculous affections to relieve irritation.

COLLINSONIA.

THE ROOT OF THE COLLINSONIA CANADENSIS.—U. S.

Preparations.—In its olden time use as a diuretic, an infusion of the entire plant was employed. For its specific use, we employ a tincture of the root.

Dose.—Of the tincture, from the fraction of a drop to ʒss. according to the use of the remedy.

Therapeutic Action.—Collinsonia is reputed diuretic, diaphoretic, tonic, astringent, stimulant, carminative, emetic, discutient and lithontriptic. Numerous are the properties said to be possessed by this agent; and it is often employed in domestic practice for various purposes. It is esteemed diuretic, and has been used in dropsies and chronic diseases of the urinary passages, and is a reputed lithontriptic, and as such has been highly extolled in calculous affections. As to its capability of dissolving urinary concretions, we have our doubts, although it may be serviceable in allaying the irritation caused by the presence of calculi. It has been found useful in colic, spasm of the stomach and bowels, and "after-pains," owing to its stimulant and carminative properties, and favorable reports are made of its utility in "night-sweats." As a tonic it has been recommended in indigestion, and as a diaphoretic in rheumatism. It has also been said to be an effectual remedy in headache. Prof. Wood states that a decoction of the fresh root is said to have been used with advantage in catarrh of the bladder, leucorrhœa, gravel, dropsy and other complaints; and the leaves are applied by the country people, in the form of cataplasm or fomentation, to wounds, bruises and sores, and in cases of internal abdominal pains.

Specific Indications—Irritation with sense of constriction in the larynx. Pressure at the supra-renal notch. Oppression with tightness in epigastrium. Painful constriction of rectum, of ostium vaginæ, and of urethra. Hemorrhoids, with contraction of the sphincter, and sense of foreign body (irritant) in the rectum.

Specific Uses.—The indications as above given will give a quite extended field for this valuable remedy. Our first use of the remedy was in minister's sore throat, for which it is as near a specific as a remedy can be for the name of a disease, It is also a prominent remedy in chronic laryngitis, and in some cases of trachitis and bronchitis.

In functional heart disease, with gastric irritation, it is a prominent remedy. It is also a remedy in some cases of chronic gastritis, and irritative dyspepsia. In these cases I give it in the large doses—℞ Tinct. Collinsonia ʒj. to ʒij., Simple Syrup ℥iij. to ℥iv.; a teaspoonful every four hours.

In diseases of the rectum, and in hemorrhoids with the indications given, we employ the small dose—℞ Tinct. Collinsonia gtt. v. to gtt. x., water ℥iv.; a teaspoonful every three or four hours. With the sense of constriction, and of an irritant body in the rectum, it is as prompt and direct as any remedy in the materia medica.

It is not so frequently indicated in diseases of women, or in diseases of the urinary organs, but cases will be found in which it goes directly to the spot, and gives relief.

ERIGERON.

THE PLANT OF E. HETEROPHYLLUM, E. PHILADELPHICUM.—U. S.

Therapeutic Action.—These species of Erigeron are diuretic, tonic, diaphoretic and astringent. The two species possess identical medical properties, and are highly esteemed by many practitioners in gravel, nephritic affections and certain forms of dropsy. Dr. Wistar of Philadelphia used them with much advantage in hydrothorax complicated with gout. The infusion or decoction of fleabane is said to have increased the secretion of urine in a single day, from twenty-four to sixty-seven ounces. From this we may infer that it possesses no ordinary amount of diuretic power. It affords relief in strangury produced by cantharides, suppression of urine, gravel, diabetes, chronic nephritis, and other urinary affections. It has also been recommended as a diaphoretic in cutaneous diseases, rheumatism, etc., and as an astringent in hemorrhages and chronic diarrhœa, though it is not equal to the Canada Fleabane for this latter purpose. It is also said to have been serviceable in coughs and catamenial obstructions.

ERYNGIUM.

THE ROOT OF ERYNGIUM AQUATICUM.

Preparation.—Tinct. Eryngium.

Dose.—From the fraction of a drop to ʒss.

Therapeutic Action.—Eryngium is considered diuretic, diaphoretic, expectorant, stimulant, sialagogue, and in large doses emetic. This agent is said by some to be a powerful diuretic, useful in atonic dropsies, and also in gravel, chronic nephritis and other urinary disorders. Its efficacy as a diuretic may have been overrated by the class of writers referred to, but still there is sufficient respectable testimony in favor of its utility in this respect to entitle it to further notice. It acts as a general excitant, promotes expectoration and diaphoresis, and when masticated provokes a free flow of saliva. As an expectorant, it has been used with advantage in chronic bronchial affections, attended with free or profuse expectoration. It has also been employed in languid states of the stomach to promote the appetite and digestive powers in cases of general debility, and in the convalescence of many diseases.

Specific Indications.—Burning with itching in the bladder, and upper part of the urethra. Burning sensations in the region of the kidneys, and down the ureters.

Specific Uses.—The Eryngium is a prominent remedy in chronic diseases of the bladder, either inflammatory or irritative. Associated with a sedative it meets the indications in acute cystitis. Alone it relieves unpleasant irritation which might result in inflammation. It is also a valuable remedy in chronic cystitis, when there is but little secretion, and sometimes when there is a free deposit of the triple phosphates.

Occasionally it exerts an admirable influence in relieving uterine irritation, the bladder being also involved.

It is a remedy to be thought of in chronic nephritis, or indeed in any case in which the deep seated burning is a marked symptom.

ARALIA.

THE BARK OF THE ROOT OF ARALIA HISPIDA.—U. S.

Dose.—Aralia is mostly administered in decoction. One ounce of the dried root to a pint and a half of water, boiled down to one pint. Dose, two to four ounces, repeated as often as the stomach will bear it.

Therapeutic Action.—Aralia is diuretic, alterative, purgative, emetic and detergent. It is an important diuretic, though but little used, and apparently but little known. It is the most efficient remedy in dropsies, especially in anasarca and ascites, with which we are acquainted. As an individual agent, if we were to select but one, for the cure of the varieties of dropsy named, this is the one we should choose. It greatly augments the flow of urine, promotes absorption, and if taken very freely, causes catharsis. It is an excellent vehicle for the exhibition of cream of tartar; one or two ounces added to a pint of a strong decoction of Aralia, and taken in the course of twenty-four hours, will rapidly reduce any dropsical swelling. Like other species of Aralia, it possesses valuable alterative properties, and if taken in large doses, it is emetic.

LIATRIS.

THE ROOT OF LIATRIS SPICATA.

Dose.—Of the powdered Liatris from one-half to one drachm, taken in some warm infusion. Of an infusion of one ounce to a pint ot boiling water, macerated for two hours, from one to four ounces.

Therapeutic Action.—Liatris is diuretic, stimulant, diaphoretic, tonic and emmenagogue. It is a mild, and yet energetic, stimulating diaphoretic, and very valuable whenever an agent of this character is indicated. It is also an excellent stimulant, appropriate in all cases where a carminative and excitant are required, as in the debility of the digestive organs, colic, spasm of the bowels, etc. It is a useful and even superior stimulating diaphoretic, and may be employed in the advanced stages of fever, and where there is coldness of the surface and want of action in the cutaneous capillaries. Associated with these valuable properties are its tonic powers.

Some regard the Liatris as an emmenagogue and deobstruent, and it may possess such properties. Its supposed emmenagogue powers may depend upon its general excitant influence upon the whole system, or upon the secretions in particular, or its direct action upon the urinary organs may be sufficient to account for its sympathetic action upon the uterus. It is frequently recommended in scrofula, pains in the chest and after-pains, and is said to exert a salutary influence in all these cases.

TARAXACUM.

Dose.—Of a decoction of two ounces of the bruised root to a quart of water, boiled down to a pint and strained, one to three ounces, three or four times a day. Of the extract, from twenty grains to one drachm, three times a day.

As a diuretic and curative agent, Taraxacum is beneficial in those dropsical cases occasioned by hepatic torpor or engorgement, and visceral enlargements and obstruction, when unattended with over-excited vascular action. Its tonic, aperient and alterative properties, associated with its diuretic action, contribute much undoubtedly to the relief of those cases to which it is thought to be especially adapted. It is mostly employed in the form of a decoction or extract. The bitartrate of potash, or some other saline purgative, is frequently added to the decoction.

SAMBUCUS.

The young roots of the *common elder* possess diuretic properties. A decoction made of the roots and drank freely, will be found beneficial in dropsical affections; it may be associated with juniper berries, horseradish, cream of tartar, etc., with much advantage. The inner bark of the elder forms an efficient hydragogue cathartic and diuretic; it may be employed tinctured in wine or cider. It is taken to the extent of keeping the bowels loose.

PAREIRA.

THE ROOT OF CISSAMPELOS PAREIRA.—SOUTH AMERICA.

DOSE.—Of an infusion of Pareira, one ounce to a pint and a half of boiling water, macerated for two hours in a tightly covered vessel, and strained, from one to three ounces. Of the tincture, from ten drops to half a drachm.

THERAPEUTIC ACTION.—Pareira is esteemed diuretic, tonic, lithontriptic, antilithic and aperient. It acts specifically upon the urinary organs as a diuretic, changing the quality of the urine, and lessening irritation of the genito-urinary mucous membrane. At one time it enjoyed a high reputation as a lithontriptic, or dissolver of stone, but it does not at this time retain that repute, although it is believed to change the quality of the urine, and consequently destroy the tendency to the production of calculi, and is therefore pronounced antilithic. It is now employed almost exclusively in discharges from the genito-urinary mucous membrane, as in chronic irritation and inflammation of the kidneys and bladder, gonorrhœa, leucorrhœa, calculous affections, etc.

SCILLA.

THE BULB OF SCILLA MARITIMA.

DOSE.—As a diuretic, squills are generally administered in powder, this being the most efficient form in which they can be given; dose, grs. j. to gr. iij., repeated two, three, or four times a day, until nausea is excited, or its action on the kidneys evinced. Its preparations will be described under the class Expectorants.

Therapeutic Action.— Squill is diuretic, expectorant, emetic and acro-narcotic. In small doses it excites the secretory and excretory organs. It promotes the bronchial and intestinal mucous secretions, and increases the secretion of urine in a remarkable manner, thereby promoting the absorption of effused fluids, an indirect effect arising doubtless from the increased diuresis. It acts as an irritative stimulant upon all the surfaces and parts with which it comes in contact, and thus disturbs the process of digestion and assimilation.

As a remedial agent it is principally used as a diuretic and expectorant, and sometimes as an emetic. As a diuretic it is a popular remedy in dropsies requiring the use of stimulating remedies of this class; torpid and leucophlegmatic states of the system are the ones in which it is most frequently used.

COPAIBA.

THE OLEO-RESIN OF COPAIFERA OFFICINALIS.—South America.

Dose.—Of Copaiba from gtt. xx. to ℨj. or more, three times a day, in capsules. This is said to be the most efficacious way to exhibit it in urinary diseases.

Therapeutic Action.—Copaiba is diuretic, stimulant, laxative and emetic. In small doses it acts as a special stimulant to the mucous surfaces, causing a sensation of warmth in the stomach, eructations, and often from its nauseous taste nausea and vomiting; by its continued use the appetite is impaired and the digestive functions disordered. From the absorption of the balsam or its oil, a stimulant action is exerted upon all the secretory organs, the mucous membranes and urino-genital organs in particular. The oil escapes in part by the pulmonary exhalation, as is perceived by the breath. It increases the renal secretion, and manifests its presence in the urine by its balsamic odor, bitter taste, and change of color. It excites a sensation of warmth and tickling in the urethra, and sometimes an irritation of the testicles. It also excites the pulmonary and gastro-intestinal mucous membranes, and sometimes occasions a scarlet colored eruption on the surface.

The diseases in which the Copaiba is found to be the most useful, are those affecting mucous surfaces, especially the urino-genital mucous membrane. It is a common remedy in gonorrhœa. In that disease some administer it in the first stages, in order to arrest the disease, while others wait until the acute inflammatory symptoms subside.

Leucorrhœa is another of the diseases affecting mucous surfaces, in which this remedy has obtained considerable repute. We have employed the solidified Copaiba and powdered cantharides, in the form of pills, with much apparent benefit. In chronic bronchitis, occurring in old or debilitated persons, and attended with profuse secretion, Copaiba has afforded much relief. In chronic diarrhœa or dysentery, attended with mucous discharges, especially when symptoms of ulceration exist, it has been found beneficial, and is highly recommended.

CUBEBA.

THE BERRIES OF PIPER CUBEBA.

Dose.—Cubebs are most efficient when administered in powder; dose, ʒss. to ʒj., two, three, or four times a day, or as often as the stomach will bear it. Of the tincture, ʒss. may be given three times a day in a glass of water; of the oil, gtt. x. to xv. in emulsion.

Therapeutic Action.—Cubebs are diuretic, diaphoretic, stimulant, carminative and expectorant. Like Copaiba they appear to exert a specific action on the urino-genital apparatus, acting as diuretics, deepening the color, and imparting a peculiar aromatic odor to the urine. When taken in small doses they act in a similar manner to other peppers, stimulating the stomach, augmenting the appetite, and promoting digestion. In large doses they sometimes cause nausea and vomiting, burning pain, tormina and sometimes purging; they also cause increased frequency of the pulse and thirst, and sometimes give rise to urticaria, and according to Dr. Duncan, produce swelled testicles.

They have long been used in gonorrhœa, gleet, etc., with advantage; they moderate the inflammation, and consequently the discharge. If they do not soon produce this effect, they should be discontinued, as their continued use in such cases aggravates the disease.

They have been administered in gleet, but alone they rarely produce any beneficial effect. In two or three cases we have used the combination already spoken of with entire success, but in many cases it has failed. In small doses we have administered them in combination with Hydrastine, in chronic irritation and inflammation of the bladder, with successful results.

ONOSMODIUM.

THE ROOT AND SEEDS OF ONOSMODIUM HISPIDUM.—U. S.

DOSE.—It is employed principally in the form of an infusion, half an ounce of the bruised seeds, or one ounce of the root, to a pint of boiling water. Dose two to four ounces, every three or four hours.

THERAPEUTIC ACTION.—Onosmodium is diuretic, and reputed lithontriptic. The roots, tops and seeds of this plant have the reputation of exciting the kidneys to increased action in a powerful manner, greatly increasing the quantity of urine excreted. The seeds act promptly, an increased flow of urine soon following their exhibition, as is also the case, as is said, with the roots and tops. It has been reputed a useful remedy in dropsy, and we would suppose from its hydragogue action upon the kidneys, that it would be found useful in this disease. In chronic irritation and inflammation of the urinary organs, and especially in irritation of the bladder, caused by the presence of calculi, the mildness of its action renders it highly serviceable. It is also reported as highly beneficial in suppression of urine and strangury.

POLYTRICHUM.

THE PLANT OF POLYTRICHUM JUNIPERINUM.

DOSE.—Of an infusion of one ounce to a pint of boiling water, macerated for two hours, one-half to one ounce every one or two hours, or oftener in cases of dropsy.

THERAPEUTIC ACTION.—This is one of the most valuable of our indigenous diuretics, acting mildly, and yet largely increasing the urinary secretion. It has been used with much success in dropsical diseases, and is capable of speedily and certainly reducing dropsical effusions. It is said to have caused the excretion of several gallons of fluid in twenty-four hours. It has also proved a good agent in acute stages of gonorrhœa, almost invariably relieving the troublesome ardor-urinæ attending that disease. It has also proved useful in cystitis and vesical irritation. As a diuretic we would recommend it as among the best and most reliable of this class.

DIGITALIS.

Dose.—Of powdered Digitalis, fron gr. ½ to grs. iss., repeated every six hours. Of an infusion of one drachm to half a pint of boiling water, ℥ss. Of the tincture, gtt. ij to gtt. x.

Digitalis, exhibited in small and gradually augmented doses, acts as a specific excitant to the kidneys, promoting the secretion of urine; on account of this property it has been much used by some practitioners in dropsical effusions. Pereira says: "Of all remedies for dropsy, none have gained more, and few so much celebrity as fox-glove." Its curative powers are referred to its sedative influence, repressing arterial excitement; to its power to promote the action of the absorbent vessels, and to its diuretic action.

OLEUM TEREBINTHINÆ.

Dose.—As a diuretic and special excitant of the urinary organs, ten to thirty drops, repeated every two, three, or four hours.

In small doses, frequently repeated, turpentine acts as an excitant to the kidneys, and causes an increased flow of urine. It is thought to exert a specific influence upon the mucous membrane of the bladder and urethra, exciting the vessels and the mucous follicles to a new and healthy action, and thus checking excessive mucous discharge. It is useful in chronic and atonic dropsies, as a stimulating diuretic and derivative.

It has also been administered with advantage in ulceration of the kidneys and mucous membrane of the bladder, suppression of urine, gleet, chronic gonorrhœa, blennorrhœa, leucorrhœa, diabetes, etc.

EQUISETUM.

A decoction or infusion of the common *Scouring Rush*, acts as a mild and simple diuretic, and as such it has been used in gravel, dropsical affections, irritation and inflammation of the urinary organs, strangury, suppression of urine, and other similar affections.

ARMORACIA.

The root of the *Horseradish* is an excellent stimulating diuretic in passive dropsies. It is mostly associated with other agents, as the dwarf elder, juniper berries, the root of the common elder, and other diuretics. It is adapted to torpid and atonic states of the system. The infusion of an ounce to a pint of boiling water may be administered in doses of one to two ounces. (See Stimulants.)

RUBUS ODORATUS.

The roots and leaves of the *Flowering Raspberry*, described in the class Astringents, are said to exercise a specific influence over the secretory functions of the kidneys. They have been found beneficial in suppression of urine, gravel, and in cases of chronic irritation or inflammation of the urinary organs, attended with a mucous or purulent discharge. It may be classed with the tonic and astringent diuretics. It is exhibited in the form of a decoction, which may be taken freely.

SMILAX PEDUNCULARIS.

The root of the *Jacob's Ladder* is said to possess strong diuretic and lithontriptic properties. Whether it really possesses the virtues reported to belong to it, we are unable, from present knowledge, to say. Several botanical writers and practitioners who have administered it frequently, speak very favorably of it as a diuretic in suppression of urine, dropsies, etc., and also in calculous affections. It promotes the flow of urine, and relieves the irritation incident to urinary deposits. It is used in the form of a decoction, a pint being taken in the course of twenty-four hours.

MODEOLA.

Modeola, or *Indian Cucumber*, is said to be a refrigerant diuretic, and well adapted to the relief of nephritis, cystitis, and other inflammatory states of the urinary apparatus. Prof. Barton thought it useful in dropsies. It is an article that has attracted but little attention, and we are not aware that it possesses any particular merit as a diuretic.

PINUS PENDULA.

The bark of the *Tamarac*, elsewhere described, possesses diuretic properties, and as such may be used with advantage in atonic dropsies, owing to its tonic and stimulating properties. It is mostly combined with other more active diuretics, when administered in dropsy. The decoction may be used freely, a pint or more being taken in the course of the day.

MENTHA VIRIDIS.

The *Spearmint* is administered as a diuretic with advantage in suppression of urine, strangury, passive dropsies, diabetes, and other disordered states of the urinary organs. It is often combined wlth other diuretics to improve their taste, prevent nausea, and add to the efficacy of the combination. A saturated tincture, prepared with Holland gin, or the green herb bruised and digested in the same liquid, is said to be very valuable as a diuretic. (See Stimulants.)

CANTHARIS.

Dose.—Of the powder, one to two grains, in the form of a pill. Of the tincture, ten drops, gradually increased to one drachm.

Spanish Flies exerts a specific stimulant influence upon the urinary apparatus. It is employed in a variety of diseases affecting the genito-urinary organs, among which may be named passive dropsy, dependent upon torpor of the kidneys, diabetes, paralysis of the bladder, incontinence of urine, amenorrhœa dependent upon uterine torpor, in loss of sexual power as an *aphrodisiac*, in spermatorrhœa, blenorrhœa, gleet, leucorrhœa, and other diseases of the urinary organs attended with a mucous discharge.

OXYDENDRON.

THE LEAVES OF OXYDENDRON ARBOREUM.—U. S.

Preparations.—Extract of Oxydendron. Tincture of Oxydendron.

Dose.—Of the extract, grs. ij. to grs. iv. Of the tincture, gtt. v. to ʒss.

Therapeutic Action.—The Oxydendron is recommended as a specific for dropsy, stimulating the kidneys to a profuse removal of water. Dr. John W. Davis reports a series of cases cured (*Journal* '81, p. 497), and others have used it with success. It is a new remedy to us, and we have not had an opportunity of testing it.

SANTONINE.

Santonine is excreted by the kidneys, and will sometimes cause irritation and partial arrest of secretion. It always colors the urine, and sometimes the color is so deep (green or blue) that people are frightened. It also affects the brain, sometimes causing giddiness, and disturbed vision, everything seeming green or blue to the patient.

It is especially for retention of urine, from atony of the bladder, that we prescribe it. It is probable that this wrong is due to deficient spinal innervation, and we sometimes have impaired respiration and tympanitis from the same cause, and for which Santonine may prove a remedy.

Retention of urine is not an uncommon symptom in the advanced stages of acute diseases of children. It is always an unpleasant symptom, for if not noticed and promptly relieved, the disease will terminate unfavorably. Here Santonine in doses of one-quarter to one-half grain, triturated with sugar, is specific. It acts promptly, sometimes giving relief with the first dose, but it should be repeated until the water passes freely.

It is also the remedy in difficult micturition and retention following parturition, and its early use will save the physician much trouble, and the woman much suffering. I do not claim, of course, that it will give relief where the tissues have lost their life by the long continued pressure of the head in difficult labor. But I am satisfied that its early use may prevent sloughing in some cases, when the ordinary want of knowledge allows retention of urine, the collection and putrescence of uterine discharges, and the general condition of nastiness that is allowed in many cases.

Whilst Santonine is not cleanliness, and not a topical antiseptic, it is one-third (and a very important third) of a good treatment.

RHUS AROMATICA.

THE BARK OF THE ROOT OF RHUS AROMATICA.—U. S.

PREPARATION.—A tincture is prepared from the fresh bark of the root.

DOSE.—The dose will vary from five to twenty drops.

THERAPEUTIC ACTION.— Dr. McClanahan, of Missouri, introduced this remedy as a specific for incontinence of urine, but whilst it relieves in some cases it fails in others, as we would suspect. Of its uses the doctor writes:—

"The great superiority of this remedy in the treatment of diabetes and enuresis led to its use in other abnormal conditions of the urinary and genital organs, viz., hematuria, uterine hemorrhage, menorrhagia, leucorrhœa, and other excessive discharges, accompanied by a relaxed condition of the uterus. I have found the remedy to act well in hematuria arising from various causes; it will be found a fine remedy in hemorrhage of the kidneys arising from a general diseased condition of the blood, accompanied by general debility, that form which sometimes precedes Bright's disease; and it will, many times, relieve the same arising from falls, blows, calculus. etc. A friend of mine, Dr. Gray, has relieved two cases of chronic hematuria with the Rhus aromatica, which he could not manage with any other remedy. I was also highly delighted with its action in uterine hemorrhage; indeed I have given it a place in my obstetric case; I regard it inferior to no remedy. I use it in the same capacity as cinnamon, erigeron, ergot, etc., the dose varying from five to twenty drops of the tincture, according to the urgency of the case.

"For the last three years I have used this remedy largely in minor diseases of children; time and space will not admit of further examples, hence I will only describe the conditions to which it is applicable: Stools profuse, skin cool and sallow, pulse small and feeble, loss of flesh, abdomen flabby, tongue pale, trembling and moist, trembling in lower limbs, general sense of lassitude and languor. Dose for infants, ten to twenty drops in a half glass of water, teaspoonful as often as necessary; for children, perhaps five drops of the first dilution."

BURSA PASTORIS.

THE PLANT OF CAPSELLA BURSA PASTORIS.—EUROPE, U. S.

PREPARATION.—A tincture of the recent plant.

DOSE.—The dose will vary from the fraction of a drop to thirty drops.

THERAPEUTIC ACTION.—Shepherd's Purse has a special action upon the kidneys and urinary tract, relieving irritation and promoting functional activity. It has given good results in incontinence of urine, especially in aged people and in women. It may be employed in chronic nephritis when a prominent spmptom is, frequent desire to pass urine and inability to retain it. It has also been used with advantage in irritation of the bladder and chronic cystitis, and in women in chronic metritis. In some cases it seems to promote the menstrual function, and when this is tardy, scanty, or arrested, it may be used as an emmenagogue.

SPIRITUS ÆTHERIS NITROSI.

DOSE—Of spirit of nitric ether, from ʒss to ʒj, or even ʒij, every two, three or four hours.

THERAPEUTIC ACTION.—Sweet spirits of nitre is diuretic, diaphoretic, stimulant and antispasmodic. It is an excellent diuretic, mild and unirritating in its action, and well adapted to the relief of inflammatory states of the urinary organs, as gonorrhœa, gleet, ardor-urinæ, strangury, suppression of urine and other kindred disorders. In suppression of urine and dysuria recurring in infancy, it is a convenient and useful remedy. In the cases named, it may be given in some diuretic infusion, as melon-seed, spearmint, juniper, mullein, etc.

It is much employed in febrile diseases, for the reason that it promotes diaphoresis as well as diuresis. If it fails to promote the renal, the cutaneous secretion will be increased. It acts both as a general stimulant and cutaneous excitant or diaphoretic.

As a stimulant, carminative and antispasmodic, it is useful in gastrodynia, flatulence and intestinal spasms; tincture of opium, sulphuric ether, or camphorated spirit of lavender, add much to its efficacy in these cases. In febrile diseases attended with nausea and vomiting, gastric irritability, or restlessness and inquietude, it allays the irritability, and often procures sleep; thus manifesting anodyne, antispasmodic and nervine powers.

POTASSÆ ACETAS.

Dose.—Of acetate of potash, from grs. x. to ʒj. largely diluted with water, and repeated as often as may be necessary. We administer three drachms daily in diseases in which we need its depurative action.

Therapeutic Action.—Acetate of potash belongs to our class of *renal depurants*, and may be considered as the type of this class. It is a certain and efficient diuretic when given largely diluted with cold water, but frequently proves diaphoretic if given in warm water, and the surface is kept warm. It does not, like the organic diuretics, greatly increase the amount of urine voided, though this is sometimes the case, but invariably increases the amount of solids held in solution in it. (See Action of Diuretics.)

In febrile diseases we administer this agent to remove from the blood any morbid or disintegrated material which may be retained within it; and if this is accomplished, we have removed one of the principal, if not the principal, cause of the fever. When acetate of potash is given in fever, it acts first as a refrigerant, lessening the morbid heat of the body; it causes an increased secretion of urine, and a removal of a large quantity of excrementitious organic matter, the product of disintegration of the tissues. It also, in a majority of cases, lessens the heat of the surface, relaxes the skin, and causes gentle perspiration. That it does "*purify*" the blood, may be easily ascertained by the changed character of any exudation from that fluid, as the "*coating*" of the tongue, which will rapidly lose its dark color, and in a few days will be entirely removed. We do not claim that this agent alone will cure fever (and yet we have seen the fever removed by it in less time than by any other treatment), but we believe it fulfills one of the prominent indications of cure. In febrile diseases we administer one drachm three times a day, with bitter tonics and suitable diaphoretics, keeping the bowels in a soluble condition; and since we have adopted this treatment, no case has passed over the seventh day. It may be administered in acute inflammations, as pneumonia, hepatitis, etc., with the same success, appearing not only to lessen the febrile excitement, but checking the progress of the inflammatory action in a remarkable manner. It is also among our most reliable agents in the treatment of rheumatism, whether acute or chronic. In acute rheumatism we have seen entire relief given in forty eight hours, the remedy increasing the solids excreted in the urine of twenty-four hours, not less than 260 grains, after deducting the three drachms of the salt administered. We have also found that in chronic rheumatism the disease could be as effectually subdued by this as by any other remedy, and in a much shorter space of time.

In scrofula, secondary syphilis, chronic skin diseases, or any cachetic habit of body, when we have good reason to suppose that the blood is diseased, or contains the disintegrated elements of the worn out tissues, this will be found one of our most beneficial *alteratives*. On this subject Dr. Golding Bird says: "I would most earnestly beg those who are now doing the honor of listening to my remarks, to give a careful and steady trial to the *depurating or chemical diuretics*, especially the salts of potash with vegetable acids, when they are called upon to treat a chronic affection in which the exciting cause, or existing disease, depends upon the presence of some product of less vitality or imperfect organization. I fully believe that in many instances such matters will often be found to yield, whether they present themselves as albuminous deposits in glands, furuncular disease of cellular tissue, or incrustations on the skin, as in some of the squamous and tubercular cutaneous diseases. That they will succeed in increasing the waste of matter, is, from my observation, beyond all doubt; that the lowest vitalized matters will yield to the solvent the readiest is most probable, and that an important and powerful addition has been made to our supply of therapeutic weapons is certain."

Acetate of potash is exhibited in the uric acid diathesis. It is decomposed by the digestive and assimilative process, the vegetable acid set free, while the alkali is absorbed into the circulation, thus destroying the acid, and greatly promoting the action of the kidneys, and thereby counteracting the formation of urinary concretions.

POTASSÆ CITRAS.

Dose.—Of the solid citrate of potash, from gr. xx. to ʒj. largely diluted with water.

Therapeutic Action.—Citrate of potash belongs to the same group, possessess the same properties, and may be used to fulfill the same indications as the acetate just described. It increases the secretion of urine, causing an elimination of the disintegrated or broken-down tissues of the body, proves refrigerant, and if the surface is kept warm, and the remedy given in warm water, it induces diaphoresis. Pereira states that "it is an excellent refrigerant, soothing or sedative diaphoretic, in fevers with a hot and dry skin, and is less apt to act upon the bowels than tartrate or acetate of potash."

POTASSÆ BITARTRAS.

Dose.—As a diuretic, ʒj to ʒij, largely diluted with water.

Cream of Tartar, elsewhere fully described, is entitled to a passing notice under this head. It is diuretic, cathartic, and refrigerant. It is a very good diuretic in those dropsies termed sthenic, given in small doses, largely diluted and frequently repeated. Its action as a diuretic is greatly promoted by giving it in some diuretic infusion or decoction, and hence its curative powers in dropsy augmented. It also acts as a refrigerant aperient; and, if the dose be large, as a hydragogue cathartic. Its utility in dropsy depends upon this combination of properties.

It is not as good as either the acetate or the citrate as a renal depurant, on account of its tendency to pass off by the bowels. An excellent and very pleasant diuretic and refrigerant drink in febrile and inflammatory diseases is prepared by dissolving one or two drachms of this agent in one pint of boiling water, to which sugar, lemon juice, or lemon-peel may be added: it is taken cold. Cream of Tartar Whey is prepared by adding about two drachms of the bitartrate to one pint of new milk; the curd is removed by straining; diluted with water, it forms a pleasant and useful drink in dropsies, and some febrile diseases.

POTASSÆ NITRAS.

Dose.—Of Nitrate of Potash, as a diuretic, from grs. x. to grs. xx., dissolved in ℥j. of water, and repeated every two, three, or four hours.

As a refrigerant, diaphoretic, and diuretic, Nitrate of Potash is very valuable in febrile and inflammatory diseases. It promotes both the perspiratory and renal secretions, diminishes the temperature of the body, and lessens the frequency of the pulse. It will be readily seen that such a combination of properties will render it an efficient agent in controlling febrile and inflammatory action. Its powers in this respect are greatly promoted by combining it with ipecacuanha and other nauseating and diaphoretic agents. We frequently make use of the compound powder of Asclepias and Nitrate of Potash, spoken of under the class diaphoretics, in these diseases, and especially in acute or inflammatory rheumatism, and with the most satisfactory results. This combination promotes the secretions, especially of the skin and kidneys, and greatly lessens exalted organic action. In bilious fever, attended with torpor of the liver, hepatic congestion and intestinal inactivity, it may be associated with small doses of Podophyllum or Podophyllin with much benefit. (See Diaphoretics.)

SODÆ ACETAS.

Therapeutic Action.—Acetate of Soda is a mild diuretic, similar in its properties to Acetate of Potash, but not near so efficient in its action. It may be employed as a substitute for that salt, and may be exhibited with greater facility from the fact that it is not deliquescent. It is seldom used at the present day.

TINCTURA FERRI CHLORIDI.

Dose.—Of this agent, from gtt. x. to ʒss. or even ʒj., given largely diluted with water.

Tincture of Muriate of Iron, described under the class Astringents, is tonic, astringent and diuretic. It is thought to exert a specific influence over the urinary organs, and hence has been used in gleet, long-standing gonorrhœa, dysuria, irritability of the bladder, especially of females, in chronic mucous discharges from the genito-urinary organs; in passive uterine, renal, and vesical hemorrhages; and in spasmodic stricture of the urethra, preventing the introduction of the catheter. In the latter case from ten to twelve drops are given every ten minutes until the spasm is overcome.

DIVISION II.

CLASS V.

SEDATIVES.

SEDATIVES may be defined to be those therapeutic agents which calm or diminish irritation, and rectify sympathetic innervation. They may be divided into general and special, the first exerting their medicinal influence upon the entire system, and the second producing their effect upon a special part.

Sedatives are commonly classed with narcotics, but as the latter agents act first as excitants before producing their sedative influence, and as they exert a special influence over the *intellectual functions*, are anodynes, and produce sleep, there is a marked boundary between the two classes. Again, sedatives are not ordinarily used to lessen pain or procure sleep, but as *contra-stimulants* or direct depressors of exalted activity either in the entire system, or in but a portion of it. From these facts we think a division of the two classes of agents may with propriety be made, notwithstanding the line of demarkation is not always very conspicuous between them.

Sedatives may either act directly upon the nervous system, producing sedation (*direct sedatives*), or their sedative influence may be dependent upon some other effect produced by them; sedation being dependent upon an exhaustion caused by the action of the agent, in this case we would name them *indirect sedatives*. Refrigerants exert an indirect sedative influence, as also do cathartics, emetics, diaphoretics, etc.; they depress the vital forces from their primary action, but their modus operandi differs widely from the *direct* sedatives.

Action of Sedatives.—Direct sedatives, like narcotics, are soluble in the fluids of the body, and are hence absorbed and conveyed by the blood to the part of the nervous system upon which they tend to act. That they are absorbed is proved by the fact, that their action is the same whether applied endermically, injected into the serous cavities, or under the skin. They are nerve medicines, producing their effect upon the nervous system entirely, and are thus like narcotics, transitory in their action. Some of them influence the entire nervous system, while others, unlike narcotics, expend their entire force upon some particular nerves.

In poisonous doses they may either derange or destroy nervous force, and interfere with the activities of the entire body or of a part. In the olden time the doses were often so large as to be depressant and poisonous, and if excitation and a frequent pulse were due to debility, they might extinguish the feeble flame of life. In medicinal doses, their influence is towards normal action, by giving right innervation. As a rule, frequency of pulse depends upon an excited innervation, and is associated with increased temperature. It is in these cases that physicians think of administering the special sedatives. But there are cases in which sympathetic innervation is enfeebled, and the temperature too low, but the pulse is rapid, as in cholera, yet a sedative like Aconite or Veratrum will prove a powerful remedy, by giving better innervation and circulation. The old idea that sedatives *must* be depressant, must be got rid of, as the dose we now use improves the powers of life.

Frequency of pulse is one of the most common symptoms of disease, and we are in the habit of saying—*As is the frequency of pulse, so is the gravity of the disease and the danger to life.* Every function of life is influenced by the frequency of pulse, and is impaired as we note an increased number of pulse-beats per minute. As the pulse returns to a normal standard, all the functions of life improve, and with the full establishment of a right circulation, convalescence commences.

In the hot stage of acute diseases, we notice a remarkable uniformity between the frequency of pulse, and the increasing temperature. As the pulse becomes more frequent, the temperature goes up; as the pulse is brought down, the temperature comes down. The ratio is about ten beats of the pulse to one degree of heat. With a temperature maintained steadily above 103°, death progresses rapidly. With a pulse maintained steadily above 120 beats per minute, the patient is upon dangerous ground.

Whether we think of digestion, blood making and nutrition; or of excretion by way of the skin, kidneys, and bowels; or of a restful condition and good innervation from the brain and spinal cord; or of the development and activity of zymotic poisons, or the rapid propagation of disease-germs, we must take into consideration the condition of pulse and temperature. With a slower pulse and lower temperature the vital processes are re-established. With increased frequency of pulse and temperature, the vital processes are impaired, and the intensity of their poisonous materials increased.

In proof that their effects are transitory, we may mention the fact that in poisoning by hydrocyanic acid, when the quantity taken is not too large, if artificial respiration is maintained, and the arterialization and circulation is thus carried on for a time, the nervous system may recover from the deadly effects of the agent, and resume its normal function.

Therapeutic Indications.

Sedatives reduce the momentum of the circulation by rectifying the innervation of the heart; the pulse becomes slower and better when the patient retains the recumbent position; but its rapidity may be increased by any muscular exertion, the increased action compensating for its diminished energy. They lessen the action of the respiratory organs; by lessening the sensibility of the pneumogastric nerve; they diminish the sensation of want of air, and hence, even if the motor nerves were not affected, respiration would be slower. As the respiration is slower, the amount of oxygen conveyed into the system is less in quantity, and calorification is diminished. They lessen the tonicity of the muscular fiber, by removing the irritation of the motor nerves. This is apparent from the general relaxation which follows their employment, and by the softened feel of the pulse at the wrist.

The primary influence of the proper stimulants is most undoubtedly exerted upon the cerebro-spinal system, but not the case with sedatives; the influence of sedatives is not therefore antagonistic to, or the reverse of stimulants.

From what has already been stated, the therapeutical application of this class of remedies must be apparent; they are adapted to all cases of exalted organic action, inflammation, fever, etc. The excited heart, elevated temperature, hard and unyielding pulse, and the disordered state of the special senses, call for the administration of remedies fitted to appease their exalted energy; and such agents we have in the class we are now considering.

I. *Action in Fever.*—In fever of a sthenic character, accompanied with a high grade of reaction, both *direct* and *indirect* sedatives may be used with great advantage. The latter class of agents are in general use in such cases; thus we often administer emetics in nauseant doses, to produce their sedative influence during the febrile paroxysm; by them we produce a direct sedative influence upon the nervous centers, the action of the heart is lessened, the respiration is slower, and the muscular system is relaxed. Specific emetics, however, if given in nauseant doses, without producing vomiting, might with much propriety be classed with sedatives; they act upon the nerves as special sedatives, producing their nauseant and emetic effect, it is supposed, by their influence upon the pneumogastric nerve. Their beneficial effect in sedative doses, we suppose, is also exerted upon this nerve, and by this special sedation they lessen the action of the heart and lungs. The sedative action of these remedies, however, is partially antagonized by the reaction accompanying emesis.

Direct sedatives, as aconite, veratrum viride, etc., exert a like sedative effect to emetics, without, however, producing nausea, or the reaction produced by vomiting. By their action upon the nerves of the heart and lungs, they check the excited action of these organs, reduce the frequency of the pulse, and produce relaxation of the entire system. Thus, under the use of the two agents named, we have seen the pulse reduced from 130 beats in a minute to 70; the pulse would become soft and full, the system relaxed, and perspiration induced. If the effects of the remedy were permanent, there would be but little need of other medicine; but as the agents are neurotic, their effects are transitory, and without the agent is repeated, the advantage gained is soon lost.

The question might then arise, if their effects are so transient, what benefit will be gained by their administration? In the first place we prevent the progression of the disease until other remedies have had time to produce their remedial effects; we also induce a state of the system that is favorable for the operation of remedies generally considered to be curative. Thus we may easily produce diaphoresis when the system is thus relaxed, and by this means reëstablish a normal secretion, and cause the elimination of any morbid material existing in the blood. Their action in this respect will be seen to be the more important, when we reflect that these diseases frequently arise from suppression of this secretion, and with what difficulty it is ordinarily reproduced in high grades of fever. The same remarks will apply to other secretions with the same propriety; for instance, the kidneys in fever do not eliminate from the blood their normal secretion; nor can we produce diuresis during high febrile excitement, without great difficulty; yet under the relaxing influence of one of these sedatives, the circulation is slower, and free diuresis can be easily produced.

Not only do they act as valuable auxiliaries in the treatment of fever, but they actually in many instances prove curative without any other treatment. Thus we have seen disease completely broken up, by keeping up their influence for twenty-four or thirty-six hours; under their relaxing and sedative influence the secretions became free, and the system, relieved of the high degree of excitement, in this time freed itself of the materies morbi which produced and kept up the febrile reaction. Nor are we alone in believing them to be curative agents, for many have witnessed similar effects, and there are probably none who have used the two agents named, but what have noticed them in some instances.

Compare the action of such an agent with the *lancet*, the great sedative agent of some practitioners, and we will clearly see the difference between sedation, produced by a nerve medicine, and that produced by *exhausting the system of a fluid necessary to its existence.* In the one case, the effect is temporary, a *stoppage of nervous irritation*; in the other, sedation is the result of *exhaustion*, produced by abstracting the nutritive fluid of the body.

II. *Action in Pneumonia.*—This class of agents are of especial importance in the treatment of acute inflammation of the ungs, for many reasons.

1st. They exert a marked control over the action of the heart, and by lessening its action they prevent the rapid influx of blood to the lungs, and thus prevent the progress of the inflammation. The greater the quantity of blood sent to them, the more dyspnœa must there be, the more venous blood passing into the arteries, as well as the more risk of effusion of lymph, and the obliteration of the cellular texture of the organ. If then we can arrest this determination, by the use of direct sedatives, which we can do, we arrest the main feature of the disease—in fact we stop the inflammatory action, and give the oppressed lungs time to recover from their morbid condition.

2d. They exert a direct action upon the pneumogastric nerve, calm its irritation, and through it exert a similar influence upon the inflamed tissue of the lung. By this action we diminish the sensation of *want of breath*, and thus do that for the lung which we do for the eye by darkening the room, or for an inflamed joint, when we prescribe absolute quiet—we do all we can to spare the exercise of the inflamed organ, which always aggravates the disease. By the same influence we check the harrassing cough, which invariably is accompanied with increased flow of blood to the lungs, and consequently increased congestion. The cough is checked, because the sensibility of the pneumogastric nerve is deadened, and it does not therefore convey to the brain the sensation of obstruction and irritation which exists in the lungs.

3d. They relax the entire system, and by lessening the rapidity of the circulation they relieve the excretory organs, and indirectly act as eliminatives. Thus, when the disease has arisen, as it may, from a morbid material in the circulation either introduced from without, or retained within the blood by the stoppage of an excretion, these agents produce that condition of the system which is favorable to its excretion.

From what has been said above, it will be evident that they are not only valuable as auxiliaries to other treatment, but they also act as direct curative agents. Especially is this the case in the first stage of the disease, for in this case they often stop the progress of the inflammation until the natural powers of the system remove the cause of the morbid process.

Indirect sedatives have long been used to fulfill the indications just described; thus we administer emetic agents in nauseant doses, to obtain their sedative effect upon the circulation, and because they diminish the sensibility of the lungs. By their use we prevent determination of blood to these organs, lessen their activity, check the cough, reduce the force and rapidity of the circulation, and produce general relaxation.

III. *Action in Chronic Diseases of the Respiratory Apparatus.*—This class of agents fulfill many indications in chronic diseases of the respiratory organs, in some cases being merely palliative, while in others they prove curative. In chronic bronchial inflammation and in phthisis pulmonalis, sedatives are valuable as palliatives, and even as curative agents. In these diseases, especially in the advanced stages, there is increased vascular action and nervous irritability, troublesome cough and hectic fever. The increased vascular activity, with the fixed irritation in the respiratory passages, keeps up an undue afflux of blood to the lungs, the presence of which, connected with the increased rapidity of circulation, tends to irritate and excite the diseased organs, and keep up and even aggravate the cough; while the cough, in return, serves to increase the general excitement and pulmonic inflammation and hectic fever. In such cases the great desideratum is to moderate the momentum of the circulation by the use of sedatives, and to lessen the nervous excitability and irritability of the lungs and general system. Sedatives abate the incessant cough, moderate the hectic fever, and prove important sanative agents in curable cases, and equally important as palliatives in cases of an incurable character.

They are also used with much advantage in asthma, pertussis, and certain catarrhal affections; they allay the irritation and resolve the spasm upon which the cough is dependent, and often effectually relieve the complaint.

IV. *Action in Inflammation of the Serous Membranes.*—In this class of diseases, the agents we are now considering exert a prompt and marked curative influence. Wherever we have inflammation of a serous membrane, as in peritonitis, pleuritis, etc., we have a far greater excitement of the vascular and nervous systems, than when any other tissue is affected. Sedatives directly remove this excitement, allay the pain, and lessen the action of the heart; and by their influence in this respect, they rapidly lessen the inflammatory action. "Inflammation," says Dr. Fergusson, "being made up of vascular and nervous action, of the afflux of blood to a part, and of pain, it is not irrational to act on both the elements of the malady at the same time, or in periods shortly consecutive of each other." By these agents we do act directly upon both; by lessening the force and frequency of the pulse, we check the vascular afflux to the inflamed part, and the medicine relieves the entire nervous system; we therefore strike directly at the foundation of the disease. Thus in peritonitis or pleuritis, by the administration of one of these agents, the veratrum viride, we may depress the action of the heart, lessen the pulse from 140 or 150 to 60 or 70 beats in the minute, relieve the severe pain, relax the system, promote the secretions, and by continuing the influence for twelve or twenty-four hours, the disease is entirely subdued.

In the first stages of puerperal peritonitis, or other forms of puerperal fever, they also exert a marked curative influence. In these cases it will not do to let the inflammation progress for twelve or twenty-four hours, while we are waiting for the action of the ordinary remedies. If we wish to cure our patient, it is necessary, in many instances, that the inflammatory process should be immediately arrested, or, at least, kept from progressing. Sedatives, in these cases, fulfill every indication; they check the afflux of blood to the inflamed part, lessen the fever, and quiet nervous irritability; and this influence we can continue as long as we may desire, by their use. If they do not prove curative in these cases, which we believe they do, they at least arrest the progress of the disease until we can influence the system with other agents.

V. *Action in Rheumatism.*—This class of agents have proved to be very valuable in that species of rheumatism termed *inflammatory.* Its action in a case of this kind may be accounted for in the same manner as in true inflammatory diseases; it reduces the action of the heart, and thus prevents the afflux of blood to the diseased part; it deadens the sensibilities of the nervous system, and it produces relaxation of the entire system, and free action of the excretory organs. In these diseases, however, they should always be combined with or followed by such agents as will eliminate from the system the morbid material that has produced and kept up the disease.

Their most marked influence, however, is observed in cases of metastasis of the rheumatism to the heart. In these cases the symptoms are always very alarming, and not without cause, for it is probably the only fatal form of rheumatism. The principal symptoms of the disease, rapid pulse, palpitation, pain in the region of the heart, and extending up to the shoulder, difficulty of respiration, etc., would indicate a condition in which these agents might be successfully employed. And we find that under their use we can control the circulation, remove the pain and other symptoms, and radically remove the disease.

VI. *Action in Disease of the Heart.*—In hypertrophy, or in dilatation of the heart, in aneurism of any of the large arteries, in palpitation of the heart, ossification of the coronary arteries, aorta, etc., or in cases of ossification of the valves of the heart, the more frequent the systole and diastole of the organ, the more anxiety and suffering will the patient experience. Hence the importance of sedatives to allay the irritation existing, and reduce the frequency of the heart's action.

They are also beneficial in angina pectoris, a disease that usually owes its origin to organic heart disease. It has been found that the surest preventive against this disease is to avoid every thing that will accelerate the circulation, as attacks of it can always be traced to either mental excitement or muscular exertion, which has caused an increased action of the heart. Sedatives, by exerting a direct control over this organ, will prevent the excitement by which the paroxysm is produced, and many authors regard this class of agents as the most appropriate in the treatment of the paroxysms. Thus Dr. Elliston recommends hydrocyanic acid as the best agent; others belladonna, stramonium, etc.

VII. *Topical Uses.*—We have already stated, that these *direct sedatives* would produce the same effect upon the nerves with which they are brought in contact, that they would upon the nervous system when absorbed and conveyed to the nerves by the circulation. They thus become very useful in neuralgia, by the topical application to the part affected. In facial neuralgia, for instance, we often observe marked benefit from the topical application of the aconite; in some instances of very intractable cases, success has been reported by making an incision, or incisions into the part affected, and injecting the sedative agents into the wounds, bringing them into direct contact with the nervous trunks.

They are also used as topical agents in some conditions of the stomach. Thus, in nausea and efforts to vomit, arising from an irritation of the stomach, and not dependent upon morbid accumulation in it, sedatives calm the irritation, check the nausea, and stop the retching. In gastrodynia, pain or spasm of the bowels, or other local neuralgic affections, sedatives often give prompt and lasting relief.

RECAPITULATION.

1st. Sedatives are agents that act directly upon the nervous system, and relieves irritation. Their action is directly opposite to that of stimulants, and as they act upon the nerves their action is transient.

2d. They are useful in all diseases of an acute character, attended with acceleration of the pulse, from their marked effect in controlling the action of the heart.

3d. They are employed in fever, to lessen the action of the heart, lessen nervous irritability, and produce relaxation; by this influence they often prove curative agents.

4th. They prove beneficial in pneumonia, by lessening the action of the heart, thus directly relieving the engorged lungs; by deadening the sensibility of the pneumogastric nerve, thus allaying cough, irritation and increased activity of these organs; by relaxing the entire system they equalize the circulation and promote secretion.

5th. They prove valuable in chronic disease of the respiratory organs, by lessening the irritation, checking the cough, and lessening the action of the heart.

6th. They are important curative agents, in the treatment of inflammation of the serous membranes, by directly controling the essential parts of the process of inflammation, circulation and innervation.

7th. They are used with advantage in rheumatism, for the reasons above named; but they are of especial importance in this disease when it affects the heart, as by their use we may control the excitement of this organ. They are also important agents in the treatment of all diseases of the heart,—angina pectoris, aneurisms, etc.,—from the same reason.

8th. Their topical use is often beneficial in local neuralgic affections, gastrodynia, etc., as they exert the same effect upon the nerves of a part when applied locally, that they do upon the general nervous system, when conveyed to it by means of the circulation.

VERATRUM.

THE ROOT OF VERATRUM VIRIDE—U. S.

Preparation.—A tincture of the fresh or recent root gathered in the Autumn in low and damp lands.

Dose.—The dose of Veratrum will vary from the fraction of a drop to gtt. x. to gtt. xx., according to the condition of disease, and the object for which it is administered. Whilst in a case of violent puerperal fever, with a temperature of 107°, or an intense inflammation of the lungs or some other part that imperils life within a few hours, the large dose may be demanded, in the larger number of cases the usual gtt. x. to water ℥iv., a teaspoonful every hour, will be a sufficient quantity.

Specific Indications.—The pulse is frequent and full, the surface flushed, the temperature above the normal standard.

The indications are very simple, yet as true as simple. The pulse frequent and full; it may be bounding or it may be hard, but the touch gives the sense of a large current of blood running rapidly. Aconite is the remedy for a small and frequent pulse. Rhus for the small pulse vibratile, or with sharp stroke. The flushed surface is a characteristic symptom, whilst increase of temperature is met by a large number of remedies.

In very minute doses, it may be sometimes administered when the pulse is small and frequent, the surface pallid and cold, and the temperature below the normal standard. But in my experience, when the remedy has proven beneficial in these, the patient has the sense of extreme heat, though deathly cold.

Therapeutic Action.—The Veratrum viride is an'arterial sedative, but if given in large doses it will produce emesis and irritation of the stomach. Mr. Worthington tested it upon himself. "He took the fourth of a grain of the alcoholic extract, which caused an acrid burning sensation in the mouth, and communicated to the throat and fauces a sense of dryness and heat, which finally reached the stomach. In the course of an hour, this dryness and burning sensation in the throat and stomach became intense, and a disposition to hiccough was excited, which soon commenced, gradually increasing in frequency till it reached fifteen or twenty times per minute. This was attended with some sickness and retching till vomiting took place. This was violent, and seemed to come on about every ten or fifteen minutes for the space of an hour. During this time, dizziness and tremor were created, which passed off with the dose. With the hiccough there was a copious secretion of saliva, and discharge of mucus from the stomach and the nose. During the action of this dose, the pulse was weakened so as to be scarcely perceptible, and reduced from sixty-eight to fifty-two pulsations per minute." We have observed similar symptoms, only more severe, in a case in which f℥ss of the tincture was taken by mistake in place of tincture of Gelseminum; in this case the pulse was reduced from about 100 to 40 beats per minute. The prostration was extreme, and there was such great irritability of the stomach, that it seemed for a while that he must die from the impossibility of retaining the necessary stimulus. The fever did not return, though for some days the patient was much prostrated; the irritation of the stomach continuing for some three weeks.

Dr. Norwood makes the following statement in regard to its properties (*Southern Medical and Surgical Journal*, January, 1853), which I give as a matter of history.

"1st. It is acrid. This property is very limited, and confined to the fauces.

"2d. It is adenagic, deobstruent, or alterative; this property it possesses in a marked and very high degree, not equaled by calomel or iodine in this particular, which will adapt it to the relief and cure of many diseases hitherto beyond the reach of any remedy.

"3d. It is actively and decidedly expectorant, so much so that we rarely add any other article.

"4th. It is one of the most certain diaphoretics belonging to the materia medica; it often excites great coolness or coldness of the surface; in some cases the skin is rendered soft and moist; in other instances the perspiration is free, and at other times it is most abundant; but notwithstanding its profuseness, it does not exhaust the system as many diaphoretics do when in excess, and therefore need not excite alarm, or be suspended on that account.

"5th. It is nervine, not narcotic under any circumstances, as since our first article we have taken it twenty times to test its varied powers, and we have taken it in all quantities from the production of free emesis down to the minimum dose. This property renders it of great value in the treatment of painful diseases, and such as are accompanied with convulsions, morbid irritability and irritative mobility. For example—pneumonia, rheumatism, puerperal fever, convulsions generally, palpitation of the heart, etc.

"6th. It is one of the most certain and efficient emetics known, and is peculiarly adapted to meet that indication in whooping-cough, asthma, croup, scarlet fever, and in all cases where there is much febrile and inflammatory action. It often excites severe nausea and frequent vomiting, which, when taken in connection with great paleness, often alarms the patient and bystanders; but these effects, when in excess, are readily relieved by two full portions of morphine and tincture of ginger, or of laudanum and brandy. One grand and leading feature is, that the exhaustion that follows is not excessive and permanent, but confined merely to the effort. Again, the matter first ejected is a large quantity of thick slimy mucus, and soon after the liver is called on to pour forth its own fluid in abundance

"7th. The seventh property is its most valuable and interesting, and for which it stands unparalleled and unequaled as a therapeutic agent. So much has been written on what we call the sedative—arterial sedative—properties of this agent, or the power it possesses of controlling and regulating arterial action, that we shall not run over the amount of evidence on this part of the subject."

We employ Veratrum in the treatment of all classes of fever, if the indications named are present. It lessens the frequency of the pulse, and gives a free and equal circulation. It lessens the temperature in the proportion that it influences the pulse, and is directly antipyretic. It relieves irritation of the nervous system, by lessening the momentum of blood to and through the nerve centers. It places the skin, kidneys and bowels (in proportion as it influences the pulse, temperature and innervation) in condition to perform their functions, and frequently without the use of other remedies secretion is established. With a better pulse, temperature, innervation and excretion, the appetite, digestion, blood-making and nutrition are restored.

We employ Veratrum in the early treatment of all forms of inflammation, without reference to the part involved, if the named indications present themselves. As is the frequency of pulse, increase of temperature, excited innervation, and arrest of secretion, so is the progress of inflammation. Bring these functions back towards the normal standard, and the inflammatory action is lessened. Thus Veratrum influences the inflammatory process, tending to abort it, by its influence upon the body at large.

But Veratrum has a direct influence upon the part involved in the inflammation, and this whether it is locally applied, or given internally. It controlls determination of blood to, and increased circulation of blood in the inflamed part; its action is to lessen the local as well as the general heat, and to relieve pain. Thus an inflammation of the lungs, or other part, may be wholly controlled by this remedy, it doing all that needs be done to rectify the wrongs of function, both general and local.

Veratrum has proven a powerful remedy in convulsive disease, when dependent upon an excited circulation. The reader will readily see why the morbid activity of brain and spinal cord ceases, when the wrongs of circulation and temperature are relieved.

Veratrum is a remedy in such forms of chronic disease as have an increased temperature and frequent pulse. For it is as true in chronic as in acute disease, that the departure from health, and the danger of death, are in proportion to the increase of heat and frequency of pulse. A case of phthisis with a temperature above 100°, and a pulse of 100 beats per minute, is certain to prove fatal. And no amendment of the local disease will take place until pulse and temperature are brought down towards the normal standard.

As a topical application we use Veratrum of full strength, or diluted with water, to arrest the inflammatory process in its early stage. A boil, a felon, a carbuncle or cellular inflammation anywhere may be thus aborted in many cases.

In one phase of erysipelas, especially active in form, Veratrum seems to exert the same specific action as tincture of muriate of iron, or Rhus. These cases are marked by the usual flush and intumescence of an ordinary inflammation. In these cases it is administered internally, and locally applied.

It is regarded by some as one of our best alteratives, and has been employed, with other means, to facilitate the removal of waste and worn-out material. In its direct influence upon any part of the sympathetic nervous system, and upon all the vegetative functions, we can see why it should do this work.

ACONITUM.

THE ROOT OF ACONITUM NAPELLUS.—EUROPE.

PREPARATION.—Tincture of Aconite.

DOSE.—The dose of Aconite should be small to obtain its best effect: gtt. v. to gtt. x. to water ℥iv., a teaspoonful every hour, serves the purpose best in most cases.

SPECIFIC INDICATIONS.—The pulse is small and frequent; usually the temperature is above the normal standard, but it is equally a remedy when the temperature is lowered. It exerts a specific action in relieving irritation and determination of blood to all mucous membranes, and is thus indicated by mucous irritation.

THERAPEUTIC ACTION.—This agent, in large doses, is a virulent poison, producing numbness and tingling sensation in the mouth and throat, difficult deglutition, numbness and tingling of the extremities, vomiting, slowness and feebleness of the circulation, impaired sensibility, and finally death. Sometimes, but rarely, the muscular power of the individual is impaired, producing inability to walk or use the arms; but in no case reported was there narcotism, the individual being generally conscious almost to the last.

In small or medicinal doses, we find that it produces but little effect perceptible to the patient, except a slight numbness and tingling in the mouth and throat; but on examination, the pulse will be found less frequent and softer, the perspiration increased, as well as the secretion from the kidneys.

If there is any one remedy which holds a first place in the treatment of disease, that remedy is Aconite. Its action is positive, and yet gentle, and always in the direction of normal function; and the indications are so frequently met with that there is hardly a case in which it is not employed at some period of its treatment.

The *small frequent pulse* is the prominent symptom in acute diseases of children, so that we have been accustomed to say, "Aconite is the child's sedative." With it alone many cases of infantile fever can be successfully treated, the only difficulty being (if the doctor is looking after fees) that the little ones are cured too rapidly. In other cases, remedies that exert a direct influence upon the nervous system, as Gelseminum, Rhus, Belladonna, etc., are employed to aid its curative action.

But we do not confine its use to children, for in a large number of cases (the majority in this locality) of the fevers of adult years, the small frequent pulse calls for Aconite. In evanescent fevers it gives relief, and is sometimes the only remedy required. In the periodic fevers it prepares the patient for the kindly action of antiperiodics. In the continued fevers, and other zymotic diseases, its action is to give a regular and uniform circulation, lessen the temperature, and favor a better functional activity of any part.

The action of Aconite in inflammation is just as direct as in febrile disease. In so far as it controls the pulse and temperature, it relieves inflammatory action in every part of the body. But it goes further, and by its action upon the sympathetic system of nerves it controls local excitement, hyperæmia.

Aconite is a favorite remedy in the early stage of tonsillitis, or quinsy. It is *the* remedy in mucous and in many cases of pseudo-membranous croup. With small doses of Aconite, frequently repeated, and the external application of Stillingia liniment, we feel confident of success, if success is possible.

Aconite will be indicated in many cases of tracheitis, bronchitis and pneumonia, in which it relieves the local irritation and hyperæmia, in addition to its general sedative effect.

It has a specific influence upon the mucous membrane of the intestinal canal, relieving irritation. Thus it is a very common remedy for diarrhœa, combined with ipecac. It is also the remedy (usually associated with ipecac) in sporadic or strictly inflammatory dysentery, the anti-zymotics and other remedies being used in addition.

It is a prominent remedy in the treatment of cholera infantum, or the summer complaint of children. It takes that group of cases which have increased heat of the trunk.

As a topical remedy we use it in the treatment of neuralgia with hyperæmia, and in the early stage of inflammation. As a spray (diluted) it is used in quinsy, pharyngitis, and some cases of laryngitis. It exerts a good influence when applied over the nasal bones in catarrh, or over the frontal sinus when the pain points there.

In acute conjunctivitis with photophobia, the tincture, of full strength, may be applied over the eye-brows. In earache it is a favorite application, the prescription usually reading—℞ Tinc. Aconite gtt. x., Tinc. Opium gtt. xxx., Glycerine ʒj. It is also a valuable remedy in the early stage of inflammation of the external ear, and applied over the mastoid process, in inflammation of the middle ear. It is a good remedy for toothache, and especially for a sensitive tooth-bone, or when there is irritation and hyperæmia of the pulp cavity.

Antidote to Aconite.—Aconite sometimes produces very unpleasant sensations of constriction and burning in the mouth and fauces, and children will sometimes become almost wild from the suffering, clutching at the mouth and throat, and breathing with difficulty. Let it be remembered that acetic acid, vinegar and water, is an antidote to these effects, and should be administered until relief is obtained. Acetic acid is also the antidote to its general poisonous influence. When we are forced to suspend the administration of Aconite, on account of its toxical effect, Veratrum should be substituted at once.

GELSEMINUM.

THE ROOT OF GELSEMINUM SEMPERVIRENS.—U. S.

PREPARATION.—A tincture of the green root.

DOSE.—The dose will vary from the fraction of a drop to ten drops, according to the use and condition of the disease. Of the old tinctures made of the strength of from two to four ounces of the green root to the pint of whisky, the dose was from one-half to one teaspoonful.

SPECIFIC INDICATIONS.—Flushed face, bright eyes, contracted pupils, with increased heat of the head, and excited innervation, are the direct symptoms. These are the evidences of determination of blood to the brain, and it is to relieve irritation and stop determination of blood to the brain, that it is especially useful. Any evidence of irritation of brain, spinal cord, or sympathetic centers, may call for this remedy.

THERAPEUTIC ACTION.—Gelseminum is sedative, febrifuge, antispasmodic and narcotic. When taken in medicinal doses we find that it produces relaxation of the muscular system, the muscles of the eye-lids being the part first affected, the patient having difficulty in opening the eyes; but if its use is continued, the entire muscular system is more or less affected; the pulse becomes less frequent and the secretions free. If the dose is excessive, there is complete prostration, almost entire loss of muscular power, dimness of vision, the pulse sinks to forty or fifty beats per minute and is very feeble, respiration slow and difficult, loss of consciousness, and in some cases death has resulted from it. It has been employed with great advantage in continued fever, given in doses of ʒj. of the old tincture, and gtt. x. of the new, repeated every two or three hours, until its full influence is produced. In these cases we find many times that its influence is very decided; it causes relaxation of the system; the pulse is less frequent and softer; the respiration is slower; the skin becomes cooler, soft and moist; there is less determination to the head, and if there was pain in it, it is reduced or entirely ceases, while at the same time we frequently notice an increased secretion of urine.

In the fevers and inflammations of child-hood, one of the most unpleasant complications met is this of determination of blood to the brain. The child is observed to be uneasy and restless, the head hot, the face flushed, the eyes bright, and pupils contracted. Gelseminum is the remedy in this case, and should be administered in the small dose, frequently repeated, with the proper sedative. Whilst it exerts a more marked influence upon the susceptible brain of the child, it is also the remedy for the adult with these symptoms.

In the treatment of intermittent and remittent fevers we meet cases (in some localities and some seasons a large number) where an antiperiodic dose of quinine can not be tolerated because of its exciting influence upon the brain. Here the patient is prepared for the antiperiodic by the administration of Gelseminum, and frequently quinine will only act kindly when combined with this remedy.

Gelseminum passes out of the body through the kidneys, and exerts a direct influence upon the entire urinary tract. It thus becomes a remedy in renal irritation, acute nephritis, vesical irritation and inflammation, and even in urethritis.

Gelseminum is a powerful antispasmodic, not only by relieving irritation of the brain and spinal cord, but also by its influence upon the motor tracts, and the relaxation of the muscular system which follows. The specific indications should be strictly followed in these cases, for we do not want to use a sedative when a stimulant is required. The evidences of coming convulsions in the forcible flexion of the hands, the sudden movements of the extremities or facial muscles, should be noticed at once, and met by this or other remedy.

It is a prominent remedy in the treatment of hysteria, meeting those cases which show irritation of the brain and spinal cord, with increased circulation. It will meet some cases of puerperal convulsions, but is not so powerful in this case as Veratrum, chloroform, or the hypodermic injection of morphia.

In obstetrical practice it will be found a remedy to remove nervous excitement (evidences of determination of blood to the brain), very painful but ineffectual uterine contractions with sense of heat and dryness. Scanty urine, with frequent desire to micturate and burning, is also an indication for its use. It is the remedy in rigidity of the os, it being thin, sharp and unyielding; in this case it causes relaxation and softness of the parts.

In neuralgia it will be found a valuable remedy if the specific indications are followed, this case being one of irritation of the nerve centers. In the olden time it was thought to be almost an infallible remedy for headache, and it is a good remedy in the cases named.

DIGITALIS.

THE LEAVES OF DIGITALIS PURPUREA.—EUROPE.

PREPARATION.—Tincture of the recent plant.

DOSE.—The dose will vary from the fraction of a drop to five drops.

SPECIFIC INDICATIONS.—A frequent pulse with enfeebled action of the heart, is the best indication. A feeble frequent pulse, with dusky flushing of both cheeks, has been thought to indicate the remedy; as has a frequent pulse with scanty urine.

Therapeutic Action.—Digitalis is sedative, narcotic, and diuretic. The views relative to its properties are discordant, and hence says a writer, " If any person were inclined to write a satire on medical evidences, the different testimonies respecting the properties of this single plant would furnish abundant materials. 'It is a diuretic,' says one. 'It is no diuretic,' says another. 'It is a stimulant,' says a third. 'It is no stimulant,' says a fourth; while a fifth contends that it has no properties at all.

In small and repeated doses, Foxglove sometimes affects the organic functions, producing disorder of the stomach, increase of urine, and alteration in the frequency, fullness and regularity of the pulse, etc., without affecting the cerebral functions.

The recumbent position greatly favors its sedative action. The pulse is found to be more frequent even in health in an erect than in the recumbent posture, and such is the case when under the influence of Digitalis.

One peculiarity in the action of Foxglove which merits especial notice, is its *cumulative effect.* By the continued use of small doses of the Digitalis no visible impression is made for a time, when suddenly and unexpectedly its poisonous effects will be developed with fearful and alarming violence, manifested by " great depression of the vascular system, giddiness, want of sleep, convulsions, and sometimes nausea and vomiting." Its constitutional effects thus developed, render its cautious administration, as to increase of dose and repetition, imperative.

In modern practice Aconite and Veratrum have taken the place of this remedy as an arterial sedative, being more certain and safer. Now it is employed principally as a "heart tonic," it being generally conceded that it exerts a stimulant influence upon this organ, which is somewhat permanent, and leads to an improved nutrition. Of course, for this purpose, the dose must be small, and usually it is associated with bitter tonics and the restoratives.

I can not recommend its use in fever or inflammation, as we have better and safer remedies. The same may be said as to its use in hemorrhage, and also as a diuretic in dropsy. In each of these cases we have direct and safer remedies.

RHUS.

THE FRESH LEAVES OF RHUS TOXICODENDRON.—U. S.

PREPARATION.—A tincture of the fresh leaves.

DOSE.—From the fraction of a drop to one drop; usually we add gtt v. to x. to water ℥iv., of which a teaspoonful may be given every hour.

SPECIFIC INDICATIONS.—A small pulse with *sharp* stroke. Frontal headache, especially pain low over the eyes, or in the right eye and orbit. Red papillæ on upper surface of the tip of the tongue. Burning sensations. Bright flushing of the surface. Burning of the urinary or genital passages.

THERAPEUTIC ACTION.—In poisonous dose, the action of Rhus is that of an intense topical irritant, with vertigo, confusion of the senses, difficult deglutition and speech, inability to command the voluntary muscles, a slow, small, irregular pulse, sense of constriction of chest and epigastrium, faintness, drowsiness, and sometimes convulsions.

Some persons are exceedingly sensitive to the poison of Rhus not only when they come in contact with it, but even when they come near it, the exhalations from the plant seeming to poison them. The topical poisoning is indicated by heat, burning pain, redness and intumescence, and by the eruption of vesicles, which will sometimes become yellow pustules. Sometimes these symptoms are very severe, and continue for days, and in rare cases the poisoning seems to become chronic, the eruption appearing from time to time for months.

Notwithstanding, a recent authority, in describing this remedy, says: "On the whole, the medicinal virtues of this plant are too uncertain to inspire confidence." I will recommend it as one of the most certain and valuable remedies in our materia medica. We see it from a different standpoint. He, from the *regular* side, prescribes at names, and gives large doses. I prescribe for special indications, and give small doses for direct effect.

It really makes no difference what the disease may be called, or where it is located, if the indications as given present, Rhus will be found a valuable remedy. It exerts a direct influence in lessening the frequency of the pulse, and giving normal circulation. The "pulse is small, frequent and sharp," elements of an imperfect flow of blood, and a condition impairing all the functions of life. Under the influence of this remedy the pulse softens, is slower, and the blood moves freely in its course.

We administer Rhus in the treatment of fevers and inflammations, associating it, in the majority of cases, with Aconite.

In the acute diseases of childhood, the indication for Rhus comes frequently in the marked excitement of the nervous system. The child starts in its sleep, has a shrill cry (*cry encephalique*) and is more than usually restless. Here the remedy exerts a speedy and most kindly influence. In other cases of fever and inflammation, its selection is by the indications from pulse, tongue, or sensation of burning.

In the eruptive fevers it finds an important place, being frequently demanded by the symptoms named. It slows the pulse, lessens the temperature, and promotes a normal appearance of the eruption.

It is a certain remedy in erysipelas, when the part shows bright redness, and the burning pain is marked. Possibly it will be indicated in full one-third of the cases we meet, tincture of muriate of iron and Veratrum meeting the indications in the other cases.

In the treatment of acute and chronic diseases of the skin, it is indicated by the redness, burning, and a vesicular eruption, similar to that produced by Rhus poisoning.

BRYONIA.

THE ROOT OF BRYONIA ALBA.—EUROPE.

PREPARATION.—A tincture of the fresh root.

DOSE.—The dose of tincture of Bryonia, will be the fraction of a drop. Experience has shown that its specific action can be best obtained by the small dose, say—℞ Bryonia gtt. v., water ℥iv.; a teaspoonful every hour.

SPECIFIC INDICATIONS.—The indications for this remedy are a hard pulse, pain in right frontal region extending to the occiput, flushing of right cheek, lancinating, tearing pain, irritative cough with pain, soreness with tensive pain in hypogastrium.

Therapeutic Action.—In large doses, Bryonia acts upon the bowels, producing watery stools, which are attended with colic, and are followed by a sense of anxiety. If a poisonous quantity be taken, the pulse becomes feeble and frequent, respiration difficult, the temperature falls, the mind wanders, and death ensues from collapse.

In the small medicinal dose, the remedy relieves excitation of the sympathetic system, lessens the tension of the arterial system, diminishes the frequency of the pulse, gives freedom to the circulation, lessens the exalted temperature, and promotes waste and excretion. If one will note the indications for this remedy, and its action upon disease, he will readily see its uses.

It has been extensively employed in the treatment of rheumatism, and with marked success when the indications have been followed. As it has a special action upon serous tissue, it has been thought to be more particularly adapted to cases involving the articulations, but its use need not be thus restricted.

It will be found a remedy in many cases of pleuritis, pericarditis, and peritonitis. It is especially to be noticed that tensive or tearing pain is an indication, as well as the sharp lancinating pain. It is a very important remedy in visceral peritonitis, arising from disease of the intestinal canal, and, indeed, any of the viscera. Sometimes the pain simulates colic, but with an unusual tenderness and tension.

It is a prominent remedy in the treatment of pneumonia, with pain, and in some cases of bronchitis the indications will point it out as a principal part of the treatment.

In fever and inflammations the indications for Bryonia occasionally present, when it will be found to have all the properties of an arterial sedative—lessening the frequency of the pulse, giving a better circulation of blood, lowering the temperature, and relieving irritation of the nervous system.

PHYSOSTIGMA.

THE BEAN OF PHYSOSTIGMA VENENOSUM.—Africa.

Preparations.—Tincture of Physostigma. Extract of Physostigma. Eserine.

DOSE.—The dose of a tincture of the strength of one ounce of the bean to two ounces of tincture will range from the fraction of a drop to five drops. The dose of Eserine is from 1-60 to 1-20 of a grain; it is applied to the eye in a solution of one part to one thousand.

SPECIFIC INDICATIONS.—In ophthalmic medicine it is indicated by too great dilatation of the pupil (usually the result of atropia), *mydriasis*. In its internal administration, it may sometimes be indicated by dilated pupil, but generally by contraction of pupil, tense, small, and rapid pulse, and sense of constriction of chest with difficult breathing. The entire facial expression shows great irritation of the spinal and superior sympathetic nerves.

THERAPEUTIC ACTION.—Attention was called to the Calabar Bean by its use by the natives in the "ordeal" to determine the guilt or innocence of a party charged with crime. Denying his guilt, he was allowed the privilege of taking the "ordeal bean," and if he survived its action, was declared innocent of the crime. It was always given in quantities sufficiently large to produce death, but in some cases the stomach rejected it, or it was passed off by the intestinal canal without being absorbed.

In the experiments of Dr. Fraser the effects seemed principally upon the spinal cord. "They were paralysis, loss of reflex action, contraction of the pupil, occasionally evacuation of the bowels, with retention of consciousness until all power of expression ceased." "Dr. Christison took about twelve grains of the kernel, which, in fifteen minutes, produced giddiness and a feeling of torpidity, followed by great weakness and faintness, paleness of the surface, extreme weakness and irregularity of the pulse, and indisposition or inability to make voluntary muscular effort."

The effects described by Dr. Christison (a most reliable observer) will point out the uses of this remedy. Here is the direction of the force, and when in disease such action will appease disease, we will select this agent. If the reader will notice, it produced a "feeling of giddiness and torpidity;" it therefore diminishes innervation from the brain and spinal cord, and is to be used when we have undue excitement from these centers. "Followed by weakness and faintness"—the same action, but influencing the muscular system, and especially that function which we know as reflex action. This is further strengthened by the record, "inability to make voluntary muscular effort." "Extreme weakness and irregularity of pulse," with paleness of the surface, shows its action upon the vascular system.

I have employed the remedy in a few cases of convulsions. In two cases of puerperal convulsions the effect was all that could be desired. In one case of infantile convulsions which the common remedies failed to control, its action was prompt and curative. I gave it in one case of epilepsy with apparently good results, but the patient removed from the city, so that the experiment was not satisfactory.

It is thought that Physostigma holds the first place in the treatment of tetanus, and a large number of cases are on record in which it has proven curative. In this case the dose of the extract should be as much as one-third of a grain, repeated sufficiently often to get its relaxant effect. It has been suggested in the treatment of poisoning by strychnia, but further evidence is required to show its antidotal powers.

Physostigma or Eserine is employed in ophthalmic medicine to cause contraction of the pupil after dilatation with atropia. When adhesions of the iris are feared, alternate dilatation by atropia and contraction by calabar bean are resorted to to break them down or prevent them.

EUPATORIUM PERF.

THE LEAVES OF EUPATORIUM PERFOLIATUM.—U. S.

Preparation.—The tincture of the fresh herb.

Dose.—The dose of tincture of Eupatorium will run from the fraction of a drop to ten drops. When indicated, gtt. x. to gtt. xx. in water ℥iv. may be given in teaspoonful doses every hour.

Specific Indications.—The pulse is full and strong, the skin is hot and moist, and the patient complains of deep-seated pain in the loins.

Therapeutic Action.—The indications, as above, give the field of use for this remedy. In the early stage of catarrhal and periodic fevers we frequently find these symptoms, as we do in the early stages of bronchitis, pleuritis, and pneumonia. It lessens the fullness and frequency of the pulse, diminishes the temperature, quiets the nervous system, and promotes secretion.

There are cases of rheumatism, especially rheumatic fever, in which its action is very decided. In these cases there is a universal ache and soreness, and perspiration is free from all parts of the body.

LOBELIA.

PREPARATION.—A tincture of Lobelia seed.

DOSE.—From the fraction of a drop to ten drops.

SPECIFIC INDICATIONS.—The pulse is full and oppressed, and the patient complains of a sensation of fullness and oppression in chest and præcordia.

THERAPEUTIC ACTION.—As has already been remarked (see emetics), Lobelia is a stimulant to the sympathetic nervous system, and especially to the cardiac and respiratory nerves. When the blood-vessels are full, and the blood moves with difficulty—full and oppressed pulse—this remedy should be selected. The labored action of the heart, the cavities being dilated with blood, calls for Lobelia. Impaired respiration, tendency to pulmonary congestion, and inability to free the bronchial tubes from the secretions, are met by this agent.

STICTA.

THE ENTIRE PLANT STICTA PULMONARIA.—U. S.

PREPARATON.—A tincture of the recent plant.

DOSE.—From the fraction of a drop to five drops.

SPECIFIC INDICATIONS.—Pain extending from the shoulders to the occiput; occipital pain increased by turning the head. Cough associated with pain in the shoulders, or in the extrinsic respiratory muscles. Pulse has a peculiar trill as if wiry, but is soft.

THERAPEUTIC ACTION.—Sticta influences the basilar brain and pneumogastric nerves, relieving irritation. The frequent pulse dependent upon pneumogastric irritation will be slowed, and other wrongs overcome. Increased temperature dependent upon this irritation will be lessened. Cough dependent principally upon nervous wrong will be relieved.

I have employed the Sticta as a remedy for the relief of cough and disease of the respiratory apparatus. It makes no difference what part is involved, or whether acute or chronic, if these indications present. It is a valuable remedy in some cases of heart disease, if the above symptoms are observed.

We employ it in the treatment of rheumatism with excellent results, if the cervical and occipital pain is present. The cases are not usually those involving the larger articulations, but annoying from the persistence of the disease.

ÆTHUSA.

THE PLANT ÆTHUSA CYNAPIUM.

PREPARATION.—A tincture of the flowering plant.

DOSE—Of the tincture, gtt. ij. to gtt. v. may be added to ℥iv. of water, and given in teaspoonful doses every two or three hours.

THERAPEUTIC ACTION.—This remedy has had but a limited use, and must be employed with care. It may be recommended in active delirium when patients become excited from slight causes, and are liable to transports of rage. There is also confusion of intellect, dizziness, as if intoxicated; violent headache with dizziness.

CACTUS.

THE PLANT CACTUS GRANDIFLORUS.—EUROPE.

PREPARATION.—A tincture of the fresh plant.

DOSE.—The dose will vary from the fraction of a drop to five drops.

SPECIFIC INDICATIONS.—Uneasy sensations in the region of the heart as of difficult or irregular movement; oppression in the præcordia; irregularity of the pulse as to time; a sense of unsteadiness and irregular contraction when the finger is placed on an artery.

THERAPEUTIC ACTION.—The influence of Cactus seems to be wholly exerted on the sympathetic nervous system, and especially upon and through the cardiac plexus. It does not seem to increase or depress innervation, (neither stimulant nor sedative), but rather to influence a regular performance of function. I am satisfied, however, that its continued use improves the nutrition of the heart, thus permanently strengthening the organ. It has a second influence upon the circulation and nutrition of the brain, and may thus be employed with advantage in some diseases of this organ. We can see very readily how this may be. The cardiac nerves are derived from the upper part of the sympathetic, and judging from the anatomy of the part, the first cervical ganglion being the principal nervous mass in the cervical region, must furnish innervation through the cardiac nerves, as it certainly controls the circulation and nutrition of the brain.

The Cactus is a *specific* in heart disease, in that it gives strength and regularity to the innervation of the organ. Its influence is permanent, in that it influences the waste and nutrition of the heart, increasing its strength. It exerts no influeuce upon the inflammatory process, and hence is not a remedy for inflammatory disease.

Feelings of weight and pressure at the præcordia, difficult breathing, fear of impending danger, etc., are at once removed. Such irregularity of action, whether violent, feeble, or irregular, as is dependent upon the innervation, is readily controlled. Thus in the majority of cases of *functional* heart disease, it gives prompt relief, and, if continued, will effect a cure. In those cases in which there is another lesion acting as a cause, as in some gastric, enteric, or uterine lesion, this must receive attention, and be removed to make the cure radical.

In structural heart disease, the first use of remedies is to relieve the distressing sensations in the region of the heart, and the unnatural fear of danger which attends them. As these spring from disordered innervation, in the majority of cases, the Cactus gives prompt relief. As we have seen above, its continuance favors normal waste and nutrition, as well as regular action. Hence, its continued use is followed by the removal of adventitious tissue, and an increase in the strength of its contractile fibre. Thus it proves curative in many cases of structural heart disease.

I have some cases on my case-book of such aggravated form that no one would believe they could live a twelve-month;

yet after a lapse of five years, they are enjoying comfortable health.

But it will not relieve or cure cases of valvular deficiency, dilatation of the openings of the heart, or fatty degeneration. It is well in estimating its action, to bear this in mind.

In its influence upon the nervous system, it more nearly resembles Pulsatilla; giving relief in that condition known as nervousness. But further than this, it gives regularity of cerebral function, and permanently improves nutrition of the nervous centers.

PULSATILLA.

THE FRESH PLANT PULSATILLA NIGRICANS.—EUROPE.

PREPARATION.—A tincture of the fresh plant gathered whilst in flower.

DOSE.—The dose of Pulsatilla will vary from the fraction of a drop to two drops.

SPECIFIC INDICATIONS.—The patient is nervous and despondent, cries easily; the pulse is small and frequent, but soft; the extremities cold; menses tardy and scanty, the patient feeling uneasy and depressed at this time; sense of fullness and weakness in back and hips at menstrual period.

THERAPEUTIC ACTION.—Pulsatilla lessens the frequency of the heart's action by strengthening its innervation, acting in this way very much like Cactus. The circulation is feeble with frequent pulse, and this remedy gives increased strength, and thus diminished frequency of movement. It strengthens sympathetic innervation in all parts, but more especially to the pelvic viscera, and in this way, probably, exerts its influence upon the reproductive apparatus. It also exerts a direct influence upon the cerebrum, influencing the anterior and upper lobes, as well as the sensory ganglia—the mind and automatic functions.

Pulsatilla is largely employed to relieve the condition known as nervousness. The patient can not command the functions of the brain, and is uneasy and restless. Sometimes with these symptoms there will be severe headache, which the Pulsatilla relieves.

We use it to relieve the head-symptoms that are met with in spermatorrhœa, prostatorrhœa, and other functional wrongs of the reproductive apparatus of either sex. The patients' fears are a source of continuous uneasiness and suffering. They fear they will die suddenly, or early in life; they fear they will lose memory, and the ability to think well; they fear they will lose procreative power, and losing this, will have lost the "chief end of man."

This nervousness gives certain unpleasant heart symptoms, relieved in some cases by Pulsatilla, in others by Cactus. The patient complains of oppression, trembling, uneasy sensations in the præcordium, and a feeling as if the machinery of life would stop. The circulation is feeble, and the pulse frequent and irregular.

A large field for its use will be found in the many unpleasant symptoms which arise from wrongs of the uterus and ovaries. These may be local or reflected to other parts, or may influence the brain and mind. But wherever they are, the common word "nervousness" describes them. Abdominal and pelvic tremors, palpitation, uneasy muscular contractions, formications, weight, dragging fullness, frequent desire to urinate, etc., etc.

Pulsatilla is one of the most certain emmenagogues when, with such symptoms as have been named, there is arrest of, or tardy appearance of the menses. We use it alone, or in many cases associate it with the Macrotys.

It is an excellent remedy in obstetrical practice to relieve the groundless fears of the pregnant and parturient woman. We can hardly concede the homœopathic teaching that "it will turn the child in preternatural labor." But by rectifying wrongs of innervation and relieving the mind, it renders labor easier.

MELLILOTUS.

THE PLANT MELLILOTUS ALBA.—EUROPE.

PREPARATION.—A tincture is prepared from the fresh leaves and flowers.

DOSE.—From the fraction of a drop to five drops.

THERAPEUTIC ACTION.—It has given excellent results in the treatment of neuralgia, especially when associated with debility. It has cured cases of many years' standing. A strong indication for its use is a marked soreness and lameness, which follows the attacks of pain. It may be administered in colic, painful diarrhœa, dysuria with painful desire to urinate, in dysmenorrhœa associated with lameness in the hip, and along the course of the sciatic nerve, and in some cases of rheumatism where such lameness is a marked feature.

ÆSCULUS.

THE NUTS OF ÆSCULUS GLABRA.—U. S.

PREPARATION.—A tincture is prepared from the recent roots when fully matured.

DOSE.—The dose will be from the fraction of a drop to five drops. Usually we add gtt. v. to gtt. x. to water ℥iv., and administer a teaspoonful every one or two hours.

SPECIFIC INDICATIONS.—Sensations of tightness in the chest and about the præcordia. Asthma, with continuous difficulty in breathing. Sense of tightness and constriction about the rectum, with uneasy sensations. Hemorrhoids.

THERAPEUTIC ACTION.—The Æsculus is a sedative to the pneumogastric and respiratory nerves, slowing the circulation when frequency of pulse depends upon excitement here. It is not determined whether it exerts its influence upon the spinal or sympathetic nervous system, but probably on the first.

This remedy has a very important use in controlling the difficulty of breathing in a form of asthma not paroxysmal. In this case the difficult breathing is persistent, and though worse at times, it has no violent paroxysm. It will also be found a valuable remedy in some cases of phthisis, where difficult breathing and oppression are prominent symptoms.

It has been used for a long time as a remedy for hemorrhoids, and if the indications are followed, it proves a very good one. There is a peculiar irritation of the small intestine, with contraction and colicky pains in the neighborhood of the umbilicus, which is relieved by this remedy. I have known this uneasiness and contraction, with intestinal dyspepsia, which had persisted for weeks and months, to be permanently cured by carrying a fresh buckeye in each trousers pocket. We get the same result from the administration of the small dose.

AMYGDALA AMARA.

Therapeutic Action.—The *Bitter Almonds* are more or less poisonous to all animals, causing tremors, weakness, palsy, convulsions, and coma. On more they cause nausea, vomiting and purging, a feeling of intoxication, and in some instances a swelling of the face and head. In large doses they are capable of producing serious and even fatal results, showing that they are analogous to the prussic acid in their effects.

The *Aqua Amygdalæ Amaræ,* or distilled water of bitter almonds, is poisonous, whether taken internally or applied externally. The emulsion of the almonds is also poisonous.

They are but little used for medical purposes, although applicable to the relief of the same cases in which the prussic acid is suggested, such as gastrodynia, pertussis, phthisis, and other pulmonary affections.

They have also been exhibited in agues; to expel the tapeworm; to relieve pain in dysmenorrhœa, etc. The sedative action upon the nervous and vascular systems, together with their demulcent qualities, entitle them to our notice in cough and irritation of the respiratory organs.

AMYGDALUS.

THE LEAVES AND BARK OF AMYGDALUS PERSICA.

Therapeutic Action.—The leaves of the Peach tree, containing as they do a considerable quantity of hydrocyanic acid, are poisonous when taken in large quantities; the bark is much milder in its action. An infusion of either the bark or leaves exerts a sedative influence upon the system, and is sometimes employed to lessen nervous irritability and the frequency of the heart's action in fevers. It has likewise been employed in irritation of the respiratory passages, combined with expectorants and demulcents, and in irritable states of the bladder, urethra, etc.

We consider an infusion of the bark one of our most powerful means of checking irritation of the stomach; and we have frequently found it beneficial in gastritis. In the extreme irritability of the stomach and consequent vomiting, which frequently proves one of the most dangerous symptoms in cholera infantum or summer complaint, we know of no agent that exceeds this in value. We have employed it in many cases with entire success when all other remedies failed to produce any benefit. It also appears to exert a beneficial influence upon the bowels, quieting the irritation and lessening the frequency of the discharges.

LYCOPUS.

THE HERB OF LYCOPUS VIRGINICUS.

PREPARATION.—A tincture of the root.

DOSE.—The dose will vary from the fraction of a drop to ten drops.

THERAPEUTIC ACTION.—The Lycopus is sedative, tonic, astringent, narcotic, and diaphoretic; it is one of our many valuable indigenous medicinal agents. In a certain class of diseases we regard it as a valuable therapeutic agent; yet it is not extensively employed, and by the majority of practitioners, it is not used at all. The properties which it possesses seem to be happily blended together, and to adapt it to the relief of certain morbid symptoms in a remarkable manner. It is a mild sedative narcotic, feebly tonic and moderately astringent.

The Lycopus may be associated with the Eupatorium and other pectoral agents, and administered in pulmonary complaints with great advantage. In drop doses it frequently proves an admirable remedy for the relief of irritative cough in chronic disease of the lungs.

It is employed in all cases of excessive vascular excitement with great advantage. Its mild and congenial sedative properties render it a remedy of great value in lessening tumultuous action. For this purpose it has been employed in febrile and inflammatory affections; more especially in the various forms of pneumonia. In these diseases its mild sedative and narcotic properties render it peculiarly valuable in lessening general irritation and diminishing exalted organic action. In acute diseases of this character, and in the chronic diseases of the respiratory organs attended with hemorrhage, it is very useful. In those diseases of a chronic character, in cases where there is a frequent hemorrhage or a tendency to hemorrhage from these organs in the incipient forms of phthisis, or even when the complaint is somewhat advanced, and even in the confirmed stages of that complaint, the sedative and tranquilizing influences of the Lycopus, together with its mild tonic and astringent properties, render it an agent of very great importance. It somewhat lessens the momentum of the circulation, the irritability and excitability of the nervous and vascular systems, and hence controls febrile excitement, and lessens the heat of the body; it lessens irritation in the lungs and consequently the harassing and exhausting cough; and if the patient is the subject of hemorrhage from the lungs, it lessens vascular excitement, and the quantity of blood that circulates in the lungs in a given time, and in this way the irritation and the cough; and in the advanced stages of the disease, when the expectoration is copious and debilitating, the sedative, astringent and tonic influences of the Lycopus point to it as an invaluable palliative remedy, if not a curative agent in all such cases. Its properties can not injure under any circumstances of the kind, and it may be resorted to with a strong probability of at least mitigating all the urgent symptoms, and even of effecting a cure.

It may be used in debility and irritability of the nervous system, and in either acute or chronic diseases attended with wakefulness and morbid vigilance. It has been used as a tonic in general debility, and also indigestion, though but seldom used in this case unless attended with pain and distress in the epigastric region. It is used by some to purify the blood in cases of old ulcers, and at the same time the ulcers are to be washed or cleansed with the infusion. It is also simmered in fresh butter, sweet oil or linseed oil, and a little beeswax added to form an ointment, which has been found useful in burns and irritable ulcers.

TABACUM.

Dose.—Grs. iij. to x. Of infusion, gtt. xl. to lx.. As an enemata, grs. xv. to xxx.

Tobacco is fully described under Narcotics, but still it merits a passing notice under the class of Sedatives. Tobacco greatly depresses the action of the heart and arteries. It is rarely used for purposes of this kind. In cases of high excitement, spasmodic action, etc., it may be used. It is mostly used in the form of enemata. As it is so fully described under the class of Naacotics, we shall not extend our remarks here, but refer the reader to that class.

CONVALLARIA.

THE ENTIRE PLANT CONVALLARIA MAIALIS.—U. S.

Preparations.—A tincture of the entire plant. Convallaramin.

Dose.—The tincture may be given in doses of from one to thirty drops. Of Convallaramin, gr. 1-30 to gr. ½.

Therapeutic Action.—Convallaria Maialis has a direct action upon the heart, giving better innervation and greater strength to its movements. When the frequency of pulse depends upon feebleness, this remedy will lessen the number of pulsations in a minute. M. Germain See makes the following statements in regard to it:—

"1. The Convallaria maialis, or *Lily of the Valley*, is an important cardiac remedy.

"2. In the form of the aqueous extract of the whole plant, given in the dose of from 15 to 20 grains daily, the maialis produces constant and favorable effects on the heart vessels and the respiration, slowing the beats of the heart, establishing the normal rhythm, increasing the force of the heart and the arterial pressure. The respiration becomes deeper and the sense of suffocation and the desire for air less troublesome and painful.

"3. The most powerful, constant, and useful effect is its diuretic, which renders it of great use in dropsies of cardiac origin.

"4. There are no contra-indications, for the remedy is applicable to all the affections of the heart. In addition to that, it has no bad effect upon the cerebro-spinal system, nor on the digestive organs. Moreover, it has no cumulative effect, nor unpleasant after results.

"5. For these reasons, maialis is superior to digitalis, which we are often obliged to give up, or at least reduce the dose of, on account of the vomiting, loss of appetite, digestive disorders, cerebral excitement, and dilatation of the pupil, which it so often produces after a more or less prolonged use. Digitalis often brings about a weakness of the heart and an increase in the number of the contractions, and in short often has directly opposite effects to those desired.

"6. To combat cardiac dyspnœa, maialis is inferior to morphia, and more particularly to the preparations of iodine, but morphia tends to cause suppression of urine."

ACIDUM HYDROCYANICUM DILUTUM.

DOSE.—One to ten drops of the medicinal acid, in almond or arabic emulsion, or simple water: very cautiously increase the dose until its effects are apparent. The acid procured at different places, and in different parcels, is found to be very variable in its strength, and therefore requires the utmost precaution in its administration.

THERAPEUTIC ACTION.—Prussic acid is sedative, anodyne, narcotic; it is an energetic poison. Its effects on all classes of animals are loss of sensation and voluntary motion, with convulsive movements. A single drop of the pure acid, applied to the throat or eye of a vigorous dog destroys it in a few seconds.

In small doses on man it produces an increased flow of saliva, irritation in the throat, bitter taste, nausea, quick and sometimes slow respiration, vertigo, pain in the head, drowsiness, and sometimes an increase, and at others a reduction, in the frequency of the pulse—salivation and ulceration of the mouth have occurred from its use.

In poisonous doses it causes faintness, vertigo, tetanic convulsions, insensibility, dilated pupils, small pulse, and difficult and spasmodic respiration. These symptoms continue but for a short time.

In very large doses death succeeds so speedily, that the foregoing symptoms are not manifested—the pulsations cease; two or three deep inspirations may occur, and finally a state of insensibility and death follows.

Post-mortem appearances generally present a glaring, or peculiar staring expression of the eyes and countenance, the peculiar odor of the acid is observed, and venous engorgement, while the arteries are empty; the blood is fluid and dark, or bluish, and the mucous membrane of the stomach injected.

The vapor of the acid produces numbness of the part to which it is applied from its action on the nerves. It acts as an irritant on the mouth and nose; causes salivation, vomiting and purging. It is supposed to be absorbed, and thus act on the brain and nervous system, but its effects are so rapidly manifested that many suppose it acts directly upon the nerves of the part to which it is applied, and its further action is extended to the sensorium-commune with the rapidity of electricity.

When prussic acid causes death, it may arise from an arrest of respiration, or from a stoppage of the heart's action. In some instances death occurs so suddenly that it can not be attributed to obstructed respiration; while in others the heart still pulsates, as has been observed by experimenting upon dogs and rabbits.

It appears to act as a direct sedative to the nerves, whether used externally or internally, and thereby suspends innervation, and hence its sedative action upon the vascular system, and its capacity to lessen pain and spasmodic action when present.

Hydrocyanic acid was at one time in high repute in pulmonary diseases, such as phthisis, asthma, pertussis, dyspnœa, spasmodic cough, chronic catarrh, etc., to allay nervous irritability and reduce vascular excitement. In incipient phthisis it is said to arrest the disease in some cases, while in the confirmed stages it acts as a palliative by lessening the cough, night-sweats and hectic symptoms.

Its exhibition in various neuropathic affections, as chorea, hysteria, epilepsy, tetanus, etc., has, it is asserted, been attended with manifest advantage. In imperfect digestion attended with pain in the stomach, it has been associated with tonics and found beneficial. It has been employed, with equivocal advantage, as an anodyne in cancer, ticdoloureux, rheumatism, etc. Breva extolled it as an anthelmintic, but Elliotson has employed it without the least advantage for this purpose.

Antidotes.—The antidotes to this acid and those substances which contain it (as the cherry laurel, bitter almonds and its essential oil, etc.), or the agents found most effectual in the treatment of its effects, are chlorine, ammonia, cold affusions, and artificial respiration. Owing to the rapidly fatal character of the poison, physicians are but seldom called in season to treat its effects.

SPIRITUS ÆTHERIS NITROSI.

Spirit of nitrous ether—sweet spirits of nitre—is markedly sedative in some cases. It lessens the frequency of the pulse, brings down the temperature, relieves nervous irritation, and stimulates secretion from the skin and kidneys. With the old ideas of the depressing action of the sedatives, the physician can hardly see how such results can follow the administration of a strong alcohol. But experiment will prove the fact, and will go far towards establishing the doctrine I have taught for years, that the medicinal action of sedatives was by improving the functional power of the heart and blood-vessels; that, instead of being depressants, they should rather be regarded as stimulants. This is now the established doctrine with regard to digitalis, is conceded by the majority with regard to aconite, and will be found equally true of the small dose of veratrum.

In the fevers of childhood, when the skin, though hot, is slightly moist, a teaspoonful of spirits of nitre in a half-glass of water, will lessen the frequency of the pulse and lower the temperature like aconite or veratrum. There are cases in which the first can not be used, owing to its unpleasant effect on mouth and fauces, and we do not care to use the second; this remedy may then be tried.

NITRO-GLYCERINE.

Preparation.—One part of Nitro-Glycerine is dissolved in one hundred parts of Alcohol.

Dose.—Of this preparation the dose will vary from one to five drops, the small dose being advised.

Therapeutic Action.—In *migraine* one or two drops of a one-per-cent solution of nitro-glycerine produces, within a few minutes, a diminution of tension in the previously corded temporal artery and relief of the pain, which in some cases does not return, but in some others recurs when the physiological effects of the drug have passed off. As individuals are affected differently by nitro-glycerine, I always begin with one minim of a one-per-cent solution, but sometimes find it necessary to increase the dose to three or four, to produce the desired effect. In some cases of *asthma*, it has relieved the breathing in a most remarkable manner: the cases in which it answers are such as would be relieved by amyl-nitrite, but its effects are more marked, and the relief is more durable.

In *angina pectoris*, the relief given by nitro-glycerine is almost complete; but as several cases have been reported in the journals, I need only mention it. The relief in these cases is not simply temporary ease from pain, but if the remedy be given thrice daily in gradually increasing doses, beginning with one minim of the one per-cent. solution and steadily advancing to eight minims, the attacks lessen both in frequency and intensity. One of my patients, who has suffered severely from angina, always carries a bottle of the medicine in his pocket, and he tells me that, by taking a dose of five drops, when he is threatened with an attack it is always prevented. —*Mr. A. W. Mayo Robson, in British Med. Journal.*

POTASSII BICHROMAS.

Dose.—For the ordinary uses, gr. ½ to grs. ij. to water ℥iv., a teaspoonful every hour.

Therapeutic Action.— Bichromate of potash exerts a specific influence upon the throat, larynx, and trachea, and to a less extent upon the mucous membrane of the bronchial tubes. It is especially when an exudation is thrown upon the surface, as in diphtheria and pseudo-membranous croup, that it has been found of special importance. In a case of diphtheria where the hoarseness and cough show the involvement of the larynx, and the remedies, Aconite and Phytolacca, do not control the disease, they may be supplemented by this remedy.

It has been employed with marked benefit in pseudo-membranous croup, alternating it with Aconite, and applying Stillingia liniment to the throat.

In any inflammation showing a tendency to a low grade of deposit, bichromate of potash may he thought of as a possible remedy.

POTASSII CYANIDUM.

DOSE.—Grain $\frac{1}{8}$ cautiously increased to gr. $\frac{1}{2}$., or it may be dissolved in eight times its weight of distilled water; a solution called by Magendie the medicinal hydrocyanate of potash. Dose, gtt. j. to x., in emulsion or mucilage, and cautiously increased till its effects are manifest.

The cyanuret of potassium is a powerful sedative, possessing the properties of the hydrocyanic acid, for which it has been recommended as a substitute. It is employed in the same diseases, and under the same circumstances.

It is employed topically in facial neuralgia, sciatica, and other forms of neuralgia, in the form of a solution or ointment. *Solution*, gr. j. to gr. iv., water ℥j.; or *Ointment*, gr. ij. to iv., adeps, ℥j. When added to poultices it relieves pain. Andral applied it in cephalalgia, which had resisted for ten months other powerful agents, as setons, blisters, bleeding, etc., gr. viij. to water ℥j., and applied by compresses wet with it to the forehead and temples.

POTASSII FERROCYANURETUM.

DOSE.—One-half ounce dissolved in four ounces of water; one teaspoonful every three hours.

THERAPEUTIC ACTION.—The prussiate of potash is sedative, but of little activity, rarely used in medicine. Dr. Smart, of Maine, however, considered it a valuable sedative in febrile and inflammatory diseases, and thinks it astringent and useful in the colliquative sweats of phthisis; he also says it produces ptyalism. The same writer has found it useful in neuralgia and pertussis. In over-doses it produces giddiness, coldness and numbness, with a sense of sinking in the epigastric region. It is to be recommended in ovarian irritation, and in hyperæsthesia of the reproductive organs at the menopause.

In chronic disease where there is marked irritability of the nervous system, with frequency of pulse, we will find it an excellent remedy. It lessens irritation of the nervous system, and acts as a special sedative to the circulation. In chronic disease of the reproductive organs in women, with hysterical manifestations, it exerts a direct and marked influence—so in hypochondriacal affections in the male.

It exerts a decided influence upon mucous membranes. When they are pallid, lax, and give increased secretion, the prussiate of potash may be used with advantage. It makes little difference, whether of nose, throat, bronchial tubes, intestinal mucous membrane, or chronic vaginitis with leucorrhœa, the influence is the same.

POTASSÆ NITRAS.

Dose.—Grains v. to xv., every two or three hours.

The nitrate of potash, elsewhere described (see Diuretics), is diuretic, refrigerant, sedative, antiseptic, detergent, diaphoretic, antiphlogistic. As a sedative or contra-stimulant, the nitrate of potash is of great value.

It is used in febrile and inflammatory diseases as a sedative or antiphlogtisic, and also to promote certain secretions, with great advantage. In diseases of a sthenic character, or when there is a phlogistic.diathesis, the nitrate of potash, associated with mucilaginous agents—ipecacuanha, opium, camphor, etc. according to the indication to be fulfilled, is capable of doing much good by reducing vascular activity, and promoting secretion.

CLASS VI.

NARCOTICS.

NARCOTICS may be defined to be agents which lessen the sensibility and irritability of the nervous system. They first act as excitants to the nervous and vascular systems, and secondarily, as sedatives to the sensorial and vital powers; and if given in suitable doses, they produce torpidity of all the functions, insensibility and sleep. The encephalon, and its appendages, it would seem, are the parts upon which the influence of narcotics are principally expended.

Narcotic and sedative are generally considered as synonymous terms, and the general opinion is, that a narcotic agent is sedative, and vice versa. It is true, that most of the narcotics are sedative—their secondary influence being that of sedation. On the contrary, many articles having no narcotic property, and rarely if ever used as such, are commonly classed with narcotics, as digitalis, veratrum viride, lycopus, etc.; and again many therapeutic agents, used as sedatives, are never classed with narcotics, as nauseants, kalmia latifolia, prussic acid, prunus virginiana, the lancet, tartrate of antimony, etc. From these considerations it will appear that, at present, no well-marked line of separation between the two classes of agents commonly denominated narcotic and sedative, exists; and yet we think there is sufficient difference in their therapeutic action and applicability, to warrant a distinction, notwithstanding the same articles, many of them, may possess properties, and fulfill indications common to both. As has already been intimated, the principal difference between the two classes, consists in the *primary excitation* consequent on the administration of narcotics — the secondary effects in both cases are quite similar. Sedatives, however, do not possess the anodyne, or soporific properties which characterize narcotics, and consequently are adapted to the fulfillment of somewhat different indications in the treatment of disease. The latter are administered as anodynes and hypnotics; they alleviate pain, allay nervous irritation, counteract spasm and procure rest; while true sedatives are administered to subdue preternatural excitement, to abate excessive or exhausting organic movements, and to counteract excessive vascular action.

Action of Narcotics.—All narcotic agents are soluble in the fluids of the body, and hence they are readily absorbed; some of them are very soluble, and their absorption is immediate; hence they act very rapidly. The remedy after being absorbed is conveyed by the circulation to the nervous centers, and produces its specific effect upon them. Why a certain agent will act as a narcotic, and what effect it has upon the nervous system is not known, and probably never will be; we therefore have to be satisfied with a knowledge of the symptoms it produces. That this class of agents are absorbed, and are carried by the blood to the part on which they tend to act, has been proved beyond a doubt. Thus those agents will produce their specific effects when absorbed from any part of the system, or when injected under the skin. Another evidence that they are absorbed into, and act from the circulation, is the celerity with which they produce their narcotic effects when applied locally. Opium, for instance, when applied to ulcers produces costiveness, headache, nausea, etc., and in short, the endermic or topical application of it is followed with the same unpleasant symptoms that attend its internal exhibition.

The attempts to ascertain the locality upon which these agents act, has not thus far been attended with much success. Flourens was of the opinion that opium acted specifically upon the cerebral lobes; that belladonna, when the dose was small, acted upon the tubercula quadrigemina, and in large doses upon the cerebral lobes also, etc. These opinions were founded entirely upon the symptoms produced by the agent, and not by any pathological change in the part supposed to be acted upon.

Narcotics also act directly upon the nerves of the part with which they are brought in contact. Thus when taken internally they prove topically sedative to the nerves of the stomach, and are often thus used to relieve the pain in gastrodynia, to allay the excitement and irritation of the gastric nerves in nausea and vomiting, etc. When taken before eating they often lessen the appetite, and may even destroy it by lessening the gastric innervation; for the same reason they retard the process of digestion—chymification, chylification and defecation may be arrested by the paralyzing influence of the narcotic.

The first sensible influence of narcotics upon the system, when administered in either excitant or sedative doses, is an increase in the activity of the circulation and cerebral functions:—the force and rapidity of the pulse is augmented, the skin becomes hotter and drier, and there is increased mental and physical activity. They produce vivacity, a lively imagination, quicken the perceptive faculties, and give muscular vigor and courage. If, however, the agent is administered in doses sufficiently large, the excitement will be of short duration, and the anodyne and soporific effect will be more intense and continue longer. The relative intensity of these primary and secondary effects varies in the different narcotics, and even in the same narcotic in different doses. If the dose is large, heaviness of the head, dullness of the intellectual faculties, dimness of sight, muscular weakness, diminution of the motor power, prostration and loss of energy, and a tendency to coma are the results. In some cases vertigo, cephalalgia, convulsions, hallucinations, total loss of the mental faculties,—and if the dose of the narcotic is sufficiently powerful,—a profound coma ensues; the pulse is full, slow and laboring; the respiration slow and stertorous; in a few hours the skin becomes cool and clammy, and the extremities cold; the pulse is feeble and threadlike, and death follows. Death is supposed to result from deficient innervation of the respiratory organs; the narcotic overpowers the brain and nervous system, due innervation is not transmitted to the respiratory apparatus, there is not sufficient aëration of the blood, and the patient dies asphyxiated.

Notwithstanding the deadly effects which they occasionally produce, when injudiciously taken, they can be used in suitable quantities to secure their anodyne and hypnotic influence with as much safety and certainty of success, as emetics or cathartics, in the various cases in which they are prescribed.

The modus operandi of each narcotic seems to be peculiar to itself; each seems to exert an influence over the sensibilities of the system, in some particulars different from any other. Thus, after one has failed to induce sleep, complete success will often attend the administration of another; and here lies the great advantage of having recourse to a variety of different agents whose general properties are the same.

THERAPEUTIC INDICATIONS.

By the sedative influence of narcotics upon the nervous system, their general tendency is to lessen the secretions of the different organs, as the liver, kidneys, mucous secretions, etc., when the parts are in a normal state; hence they produce constipation, by lessening the secretions poured into the bowels, and by deadening their sensibility and lessening their peristaltic action. It is true there are exceptions to this general rule, for some of the agents of this class promote instead of retarding the secretions; while others which lessen them in a healthy or normal state of the organs, often restore them when diminished or arrested. In opposite pathological states of the same organ, when the secretion is either diminished or excessive, they often restrain it when too profuse, and promote it when scanty, and thus exert a marked control over the secretions. When speaking of opium we shall endeavor to illustrate this peculiar action, and the proper therapeutic application of this class of agents to such cases.

The three principal indications which the physician wishes to accomplish by the administration of narcotics, are the *alleviation of pain*, the *production of sleep*, and the *relief of spasm*. As antispasmodics their utility is dependent upon their anodyne properties. There is one circumstance connected with the administration of narcotics as anodynes or hypnotics which deserves a passing notice. The physician is often disappointed when he prescribes them as soporifics, when most desirous of securing repose to his exhausted and tortured patient. The disappointment springs from administering the agent in excitant, and not in sedative doses. If administered in doses not large enough to secure sleep, it augments the excitement, and maintains wakefulness, and often begets a morbid vigilance. If the dose is increased, the nervous and vascular excitement, the excessive organic action and pain are alleviated, and all care and anxiety subside; the morbid sympathies are arrested, the mental and physical turmoil ceases, and the patient falls into a calm and comfortable state of repose, to awake invigorated and refreshed.

Those who clamor so vehemently against the use of narcotics, and offer as substitutes "*relaxants, nervines* and *antispasmodics*," deprive themselves of an invaluable class of medicines without pointing out, or being able to point out real substitutes; they have no medicines with which they can produce the same happy and very desirable influences.

If the disease in which narcotics are administered is of a protracted character, and the frequent and long-continued use of them becomes necessary, the dose will require to be augmented. The system gradually, and with more certainty loses its susceptibility to this class of agents than any other; and hence the necessity of duly increasing the dose.

With regard to their therapeutic application to particular diseases, much might be said, but we will omit many points until we come to the description of particular agents of this class. They are adapted to certain stages of almost all diseases; sometimes they are prescribed as independent curative agents, but more frequently as auxiliaries, and not unfrequently, simply as palliatives.

I. *Action in Diseases of the Lungs.*—Opposite opinions obtain relative to the use of narcotics, and particularly with regard to the use of opium (which, in some respects, is sui generis), in the various forms of pulmonic inflammation, because it is said to arrest the mucous secretions; but it would seem that the objection to the use of this article, either in the primary or secondary forms of this class of diseases, is not founded upon a proper understanding of the pathological changes which follow from its use, or which take place spontaneously as the disease advances. During the early stages of pneumonia and bronchitis, the acute inflammatory action either arrests or greatly diminishes the normal secretions; the suppression being due to the pathological condition of the mucous membrane. In such cases small doses of opium would increase the intensity of the inflammation as readily as any other excitant; and if the secretion was not arrested, but only diminished, it would entirely arrest it by its excitant influence upon the system. Now, if given in sedative doses, it will change the pathological condition which caused the arrest of the secretion; nauseating expectorants combined with it would render it doubly valuable. In sedative doses its influences would be reversed; it would lessen the intense inflammatory action which caused the diminution or arrest of the secretion, and thereby contribute to its restoration.

In the advanced stages of the acute form of the above diseases, or in their chronic form, the pathological condition of the inflamed parts has materially changed since the acute inflammation existed; which change is characterized by an increased or profuse morbid secretion from the mucous membrane. In this case it will diminish the secretion, by diminishing the inflammation upon which the increased secretion is dependent; thus they may be said to promote it in the first case, and diminish it in the second.

In the last stages of phthisis pulmonalis, in many cases, the administration of narcotics is an act of mercy, smoothing the sufferer's pathway to the grave. They lessen the irritability of the lungs, check the harrassing cough, relieve the pain, check colliquative diarrhea, and in this way not only prolong life, but make the last days of the patient, if not easy, endurable.

II. *Action in Diseases of the Stomach and Bowels.*—In gastrodynia narcotics are valuable for their topical influence upon the nerves of the stomach; they often produce a local torpor of these nerves, and thus relieve the severe pain. In irritability of the stomach producing continued nausea and vomiting small portions of morphia will allay this irritation, and check nausea and vomiting without producing any sensible effect upon the general system. The same agent is often employed in very minute doses in combination with demulcents in acute gastritis, and with marked success.

In peritoneal enteritis there is a concentration of morbid sensibility and irritability, connected with excited organic action in the peritoneal and muscular coats of the bowels.

the tension of the parts, owing to the active inflammation, approaches a spasm. This concentration of vital organic action in the exterior coat of the bowels, acts as a derivative to the mucous membrane, and thus its secretion is diminished, and the combined influences often produce obstinate constipation. Opium, by its contra-stimulant power, lessens the inflammatory action and morbid sensibility, restores the secretions, removes the spasm, and may act indirectly as an aperient, and even aid the action of cathartics.

The same narcotic is administered in another form of inflammation, both to restore and restrain the secretions and excretions. In diarrhea, we have an inflammation of the mucous coat of the intestines, with augmented secretion soon after the attack, and with frequent alvine evacuations, owing to increased peristaltic action. Opium lessens the undue activity of the bowels, and their morbid sensibility; it tends to arrest the inflammation by its contra-stimulant powers, changes the pathological character of the disease, and diminishes the secretions; and thus acts indirectly as an astringent.

The same article in the two cases just referred to, exerts the same influence in each, yet owing to the opposite pathological conditions existing in the two cases, the results vary. In the first instance the secretion is increased, and a laxative influence produced; in the second, the secretion is diminished, and constipation follows.

For the same reason that opium is so valuable in peritoneal enteritis, it is also valuable in that painful affection, colica pictonum, and in nervous and spasmodic colic. In these cases there is a diminution of the secretions, a violent tension, or even spasm of the muscular coat, obstinate constipation, etc., attended with violent pain. In such a case, a sedative dose of opium allays the pain, resolves the spasm, promotes the secretions, and facilitates the action of cathartics.

III. *Action in Fevers.*—In febrile and inflammatory diseases they are valuable as anodynes, as sedatives, and as diaphoretics. As anodynes they are very beneficial in relieving pain and subduing nervous irritability, which very frequently greatly aggravate the disease. As sedatives or hypnotics, they induce sleep, and thus directly sustain the strength, by calming the existing excitement, and allowing that repose which nature demands; they also prevent, according to some authors, the rapid oxydation which is taking place in these diseases. By subduing exalted organic action, overcoming the tension of the muscular system, and removing cutaneous spasm, they prove highly antiphlogistic, and valuable auxiliaries to nauseants, diaphoretics and refrigerants.

IV. *Action in Local Diseases.*—A local injury or a morbid exaltation of organic action of a local character, from whatever cause it may arise, very often produces general disease, and not unfrequently destroys the patient, from the severe pain and nervous irritability which it induces. Thus a burn, bruise, or abrasion of parts, a painful tumor, boils, felons, irritable ulcers, white swellings, gout, rheumatism, etc., by their high grade of local excitement, may involve the whole system in a general diseased state, through the sympathetic irritation which it produces in all parts of the system. From a wound or an injury done to a nerve, as by the thrust of a nail, thorn, or any sharp instrument, at any season of the year, but especially during the hot season, when there is increased irritability and excitability of the nervous system, that formidable disease, tetanus, not unfrequently results. In such cases a sedative dose of a suitable narcotic, together with the topical application of a similar agent, lessens the impressibility of the nervous system in general, and the nerves involved in particular, and prevents the cerebro-spinal centers from appreciating the local injury, until suitable means can be adopted to allay the local irritation, and prevent the morbid effects upon the entire system.

In numerous cases of both local and general disease, the induction of sleep by the use of narcotics, which at the same time are capable of allaying pain and excessive vascular and nervous excitement, so prejudicial to recovery, and even destructive to the life of the patient, if permitted to continue long unabated, is of the utmost importance. In cases of violent neuralgic pain, arising from loss of blood, and not dependent upon vascular repletion or cerebral inflammation, a sedative dose of opium will speedily alleviate the pain, and subdue the vascular excitement.

In cancerous, scrofulous and syphilitic diseases, where there is much irritation, pain and general excitement, they will prove valuable palliatives, and may, as auxiliary agents, exert a salutary curative influence. In incurable cancer, where the pain is severe, and the repose of the sufferer thereby interrupted, they afford great relief by allowing repose, and invigorate the system by securing a temporary respite from the protracted torture.

Narcotics are very important as topical agents, in painful scirrhus, or scrofulous tumors, hernia humoralis, nodes, buboes, or in any local or painful inflammatory affection. The sedative and anodyne influence of narcotics in the form of poultices, liniments, ointments, etc., renders them valuable therapeutic agents. They lessen the pain by their sedative, anodyne and emollient influence, and prove exceedingly valuable as discutients, if the suppurative process is not too far advanced. If there is no chance for discussion, they will advance suppuration.

In cases of cancer of the uterus, bladder or rectum, in cases of hemorrhoids, or any painful and irritated condition of those parts, narcotics are occasionally used with much advantage as palliatives, and not unfrequently prove beneficial as curative agents. They may be used in the form of injections, ointments, etc.

They are of great importance in the various spasmodic diseases. As anodynes they calm and allay that morbid erythism of the nervous system, and the inordinate organic action upon which spasm depends.

Their value is very considerable in neuropathic diseases; in all the numerous forms of which, as mania, hysteria, delirium tremens, etc., narcotics occasionally procure more or less relief.

In many cases of troublesome cough, occurring during the cold and variable season of the year, and arising from an irritation of the pneumogastric nerves, distributed to the mucous membrane of the air-passages, and not dependent upon an inflammation, narcotics, particularly opium, or morphine and its salts, will allay the irritation, and check the tickling cough, generally very promptly.

CONDITIONS CONTRAINDICATING THEIR USE.

Narcotics are contraindicated in cases of extreme debility, unless they are of a stimulant character, and administered in stimulant doses, or in combination with stimulants. They are also objectionable in encephalitis, and in paralysis, unless it is connected with, or dependent upon some local irritation or inflammation; when if other symptoms seem to demand their employment, they may be used.

Notwithstanding the numerous cases in which they are used, and the immense advantage gained by their employment, yet it must be confessed that their long-continued use is prejudicial to the well-being of the patient; for their general tendency is to destroy the functions of the nervous system. The same remarks, however, will apply with much force to the constant and continued use of medicinal agents generally. A dry skin, dry tongue, and hard pulse, contraindicate the majority of narcotic remedies. They are administed, when needed, when the skin is soft and moist, the pulse soft, and the tongue moist.

RECAPITULATION.

1st. They are administered as anodynes in cases of inordinate and excessive pain.

2d. They are prescribed in various acute diseases, attended with morbid vigilance, as hypnotics—or with a view to the production of sleep.

3d. They are useful as antispasmodics; in spasm of any part they are used with advantage, from the fact that they diminish innervation, as well of the motor as of the sensitive nerves.

4th. They are administered as sedatives in febrile and inflammatory diseases, to allay exalted organic action, as well as to alleviate pain; they are also administered, to secure their diaphoretic influence, either alone or in combination with other agents; also as stimulants, when given in small doses, in the advanced stages of fever.

5th. In cases of acute pneumonia they are administered in sedative doses, to restore the pulmonary secretion.

6th. During the secondary stage of pulmonic inflammation, when the secretions are profuse, they are administered to check them.

7th. In acute inflammation of the mucous membrane of the bowels, they arrest the secretion, lessen the pain and increased peristaltic action, upon which the frequent purging depends.

8th. In cases of colica pictonum, or peritoneal enteritis, they allay the pain, resolve the spasm, and facilitate the action of cathartics.

9th. In injury of a nerve, or excessive local pain, they prevent the brain from appreciating the local lesion and pain, until suitable local applications can be made, and the morbid sensibilities lessened; and thus prevent general disease, and often save the life of the patient.

10th. In irritation of the pneumogastric nerve, attended with a severe cough, in irritation of the mucous membrane of the stomach attended with nausea and vomiting, they often give prompt and speedy relief.

11th. In the various forms of neurosis, they are used as sedatives, anodynes, and antispasmodics.

12th. In cases of incurable cancer, and other incurable diseases, they are resorted to as palliatives, relieving the pain, procuring sleep, and making the last days of the patient more comfortable.

13th. As topical applications in scirrhus, scrofulous and all painful tumors, painful and irritable ulcers, hemorrhoids, cancer of the uterus, etc., they are important as local anodynes, discutients and emollients.

OPIUM.

THE CONCRETE JUICE OF PAPAVER SOMNIFERUM.—ASIA.

PREPARATIONS.—Opium is given in substance (pill), in powder, in tincture, the alkaloid morphia and its salts, the sulphate of morphia being most commonly employed.

DOSE.—The dose of Opium and its preparations varies greatly, according to the condition of the patient and the indications to be fulfilled. The ordinary dose of Opium is one to two grains. Of a tincture (U. S. P. laudanum), ten to thirty drops. Morphia is used in doses of from one-eighth of a grain to one half grain; larger doses should be rarely employed.

THERAPEUTIC ACTION.—Opium or its preparations, in fatal doses, produce the following phenomena: Vision is impaired, weakness ensues, consciousness is lost, coma supervenes, the surface becomes cold, the pulse small, respiration hurried and stertorous, occasionally convulsions, and finally symptoms of an apoplectic character are fully developed. Before insensibility occurs, as well as when the effects are passing off, the patient often experiences an itching of the skin, and in some cases a miliary eruption appears They are said to cause difficulty in voiding the urine, which is supposed to arise from the weakened or paralyzed state of the bladder. This last effect, according to Pereira, is more liable to follow the acetate of morphia.

They are employed with benefit in all cases of excessive pain, violent spasmodic action, in cases of loss of sleep, extreme restlessness, in gastric irritation with nausea and vomiting, in irritation of the respiratory organs attended with troublesome coughing and redundant expectoration, dysentery and dysenteric tenesmus, cholera morbus, cholera infantum, etc. In these cases, and many others in which they may be employed, they relieve pain and local irritation, promote rest, and in this way not only act as palliatives, checking the progress of the disease, but in many cases as curative agents—the natural powers of the system being sufficient to remove the cause of the disease, if the nervous excitement is subdued.

It must be recollected that when we wish to obtain the primary stimulant effects of opium, as in the low forms of fever, etc., or its influence in the suppression of morbid discharges, the salts of morphia are not so efficient in action as the crude article.

We have found the sulphate of morphia a very valuable remedy in cases of excessive nausea and vomiting, as in cholera morbus, Asiatic cholera, etc. In some cases where there are indications of crude ingesta or any morbid accumulation in the stomach, a gentle emetic may be given. As soon as the stomach is thoroughly evacuated, the sulphate of morphia may be given in doses of from one-eighth to one-fourth of a grain in a small quantity of cold water or lemonade, repeated as often as may be necessary, all fluids being interdicted for several hours. This course rarely fails to tranquilize the stomach, and prepare it for the reception of other remedies.

In mania caused by intemperance, these agents have been found highly useful. In febrile and inflammatory affections, and various diseased states of the system, attended with violent pain and great nervous excitement, they are invaluable for relieving pain, quieting restlessness, reducing exalted organic action, inducing diaphoresis, and in spasmodic states of the bowels, facilitating the action of cathartics.

As *topical applications,* the salts of morphia possess great advantages over the opium. In painful diseases of a local character, as neuralgia, rheumatism, etc., they seldom fail to afford more or less relief. In using them for this purpose, a blister is applied over the affected part, the epidermis removed, when they are applied to the naked derma. In cases of excessive nausea and vomiting, and also in gastrodynia, spasm of the bowels, etc., the same mode of employment is often productive of prompt relief. We occasionally adopt this mode of exhibition when we wish to bring the general system under its sedative, anodyne, and soporific influence, where from certain causes their exhibition by the mouth is impracticable. When used endermically, double or even triple the ordinary dose is to be employed, in order to secure their anodyne influence. They are sometimes used in the form of enemata to relieve pain, dysenteric tenesmus, nausea and vomiting, when the stomach is weak and irritable. For this purpose they are dissolved in a solution of starch and mucilage.

Where these preparations can not be taken by mouth, the effect is obtained by the use of the hypodermic injection of morphia. The action is prompt and certain, and there is not the danger of slow or imperfect absorption, or change of the remedy by the digestive fluids. The common solution for hypodermic injection is—℞ Sulphate of morphia gr. x., distilled water ℥j., of which from gtt. x. to ʒss. may be used.

The hypodermic injection of morphia has been extensively employed for the relief of neuralgia, and in some cases the relief has been prompt, and permanently curative. But in many other cases it only gives temporary relief, and requires frequent repetition, with increase of dose, and is not curative. In other cases its permanent influence is bad, arresting secretion, impairing the appetite and digestion, interfering with nutrition and normal innervation. To obtain the greatest relief in these cases, the injection should be used at the point of pain. This is contrary to the common use, which selects the inside of the arm as the most favorable point for injection, and trusts to its general rather than its topical action. In deep seated neuralgia, as in sciatica, I have made the deep puncture, and discharged the solution of morphia in contact with the nerve.

In some cases of inflammation, in the early stage, the hypodermic injection has been used with good results. This has been especially the case in pleurisy and acute peritonitis (not zymotic). But when used in inflammation there must be a soft pulse, a moist skin, and a moist tongue. If the skin is dry, the tongue dry, and the pulse hard, no preparation of opium should be used, either by the mouth or by hypodermic injection.

The hypodermic injection of morphia has been employed in cholera morbus, and associated with strychnia it can be used with good results. It has been used with success in Asiatic cholera, and is one of the means that should be thoroughly tested in the coming epidemic. I have used the hypodermic injection of strychnia, keeping patients alive twenty-four hours longer than they could have lived otherwise; and it is possible that in many cases the two remedies can be associated.

The hypodermic injection of morphia is *the* treatment for puerperal convulsions. In every case in which I have used it, it has been successful, and others give a like favorable report. The quantity injected should be from one-third to one-half grain, repeated as necessary. It has served my purpose better than chloroform, relieving the convulsions quicker, and being more permanent in its effect.

In surgery it may be used to relieve a patient from shock, either at the time of injury or from an operation. It is also claimed that a small hypodermic injection of morphia is a good preparation for chloroform. One thing is certain, that very much less chloroform can be used, if the patient has had morphine.

CHLORAL HYDRATE.

DOSE.—From grs. v. to ʒj.

PHYSIOLOGICAL ACTION.—The physiological action of chloral has been differently interpreted. Liebrich, who first discovered its hypnotic action, also Richardson and Personne, who have thought that they had discovered chloroform in the air breathed out by men and animals treated with chloral, ascribed it to a decomposition of chloral in the body, and its conversion into chloroform by the alkaline blood. But closer examination proved that almost all the chloral taken into the body passed with the urine in the shape of urochloral, and only a very small quantity of chloroform is formed by contact of chloral with blood, even for some time. It must, then, be rather due to the property common to diffusible chlorides, especially of organic origin, upon the cerebro-spinal centers. Chloral hydrate acts primarily and directly upon the gray substance of the medulla oblongata, some gray substance of the cortex, and upon the posterior tubercular quadrigemina. The respiratory centers are primarily affected, and from them a reflex action is exerted upon depressory fibres of the pneumogastric of the heart, causing a reduced pressure of the blood in the arterial system, when moderate doses are taken. In large doses, the psycho-motor and motor fibres of the gray mass of the cortex of the middle cerebral lobe, are there included in its action, which is then intensified, the circulation and respiration much affected, and complete muscular relaxation produced. The center of the common sensation is temporarily paralyzed. The sensation of the skin and the vegetative function of the body are but imperceptibly disturbed.

Direct action upon the blood by chloral is very slight, nor does it coagulate albumen to any extent. Clots found in the vessels after fatal doses of chloral, are due to the stasis of the blood in the vessels from lack of propelling power in the heart and arteries. The hypnotic action seems mostly due to a suspension of the action of the conducting fibres from the sensory to the motor centers. No impression being carried from the sensory center to the motor, and especially psycho-motor, the body rests, that is, it is in an inactive state, very much akin to that of natural sleep and hybernation. It is in no wise an anæsthetic; but the lack of perception of sensation is there, the same as all reflex motion (except that carried on in the vegetative organs) is extinct.—*Prof. Jeancon.*

THERAPEUTIC ACTION.—It has been asserted that chloral is as good a poison as strychnia. Chloral, like all powerful drugs, has a therapeutic and a poisonous action. Whether it will act as a poison or as a medicine will be determined by the quantity given and the circumstances under which it is administered. It is a well established fact that the drug in full doses depresses the centers at the base of the brain, renders respiration slower, weakens the heart's action, lowers the temperature, and produces muscular relaxation. It follows, then, that chloral, in cases of great depression, is a poison. It should never be given when the heart action is feeble.

As a hypnotic, by its action on the cerebrum, chloral is valuable when sleeplessness results from great excitement of the nervous system. When inability to sleep results from severe pain, chloral is inferior to many drugs that we possess.

As an antispasmodic, when not contra-indicated by depression, we may employ it in spasmodic diseases. Puerperal convulsions may be checked by the drug. After a full dose of morphia administered hypodermically, the patient may be kept quiet with chloral. In tetanus chloral will help to control spasm, but too much reliance must not be placed in it.

In delirium tremens the drug is much relied upon by some physicians, and often improperly administered; the depression met with in old topers renders chloral a dangerous hypnotic. In those cases where we have great excitement, increased temperature, and flushed face, chloral may be employed to produce sleep. Where the face is pale, skin bathed in perspiration, circulation feeble, and muscular system relaxed, chloral is contra-indicated.

In acute mania, with inability to sleep, we may place great reliance on chloral; if not contra-indicated I regard it as the best hypnotic at our command.

In cases where great increase of temperature with excitement and inability to sleep follow surgical operations, chloral may be employed as a hypnotic with great advantage.

In obstetrical practice, I have used chloral with good effect.

The distressing pains in the first stage of labor, may be rendered less exhausting, and rigidity of the soft parts overcome with this drug; severe after pains may be quieted with chloral.

As a local application, chloral may be used as a stimulant and deodorizer to indolent and bad smelling wounds. Twenty grains to the pint of water forms a good application. Triturated with camphor in equal proportions, it forms a fluid which, if painted upon parts suffering with neuralgia, gives at least temporary relief.—*Prof. Locke.*

HYOSCYAMUS.

THE LEAVES OF HYOSCYAMUS NIGER.—EUROPE

PREPARATIONS.—Extract of Hyoscyamus. Tincture of Hyoscyamus. Hyoscyamia.

DOSE.—The dose of the extract will be from gr. one-half to grs. ij.; of the tincture from gtt. j. to ʒss.; of Hyoscyamia gr. one-sixtieth.

Hyoscyamus is Narcotic, anodyne, sedative, and antispasmodic; it is one of the most important agents belonging to the class of narcotics.

Its effects upon the system vary very much according to the dose administered.

In small doses it acts as an excitant; but if frequently repeated, it has a sedative and tranquilizing influence upon the system. This is especially the case with patients of a highly nervous and irritable habit of body; in such it lessens irritation of the general system, and diminishes the morbid sensibility existing in any organ. Many authors do not admit that it exerts a primary excitant action. It does not induce constipation, like opium; on the contrary, it frequently proves laxative, and occasionally acts as a diaphoretic and diuretic.

In large doses hyoscyamus acts as an acro-narcotic poison. The symptoms which evince its acro-narcotic action are thirst, nausea and vomiting, violent pain in the bowels, purging, disturbance of vision, distortion of the face, dilated pupils, loss of speech, prostration, coma, delirium, paralysis, petechia, convulsions, etc., followed by death. Upon dissection, the stomach and bowels exhibit evidences of inflammation.

In medicinal doses the Hyoscyamus is found to be very valuable for its soothing and tranquilizing influence over the nervous system, especially in those cases in which, from idiosyncrasy, the opium is found to be inadmissible. It alleviates pain and irritation, promotes sleep, secures quietude, and counteracts spasm. For any of these purposes, however, it is far inferior to opium, and especially as an anodyne and hypnotic, unless it is in those cases in which opium causes head-ache, torpor of the bowels, and other unpleasant effects.

Hyoscyamus is employed as an anodyne in violent painful affections, in many cases with much benefit. Among the diseases of this character in which it has been found beneficial, may be named gouty disorders, rheumatism, neuralgia, scirrhus, carcinoma, periostitis, pleuritis, pneumonitis, trachitis, painful abscesses, nocturnal syphilitic pains, painful affections of the genito-urinary organs, violent colic pains, painful spasmodic disorders, etc.

BELLADONNA.

THE LEAVES OF ATROPA BELLADONNA.—EUROPE.

PREPARATIONS.—Tincture of Belladonna. Extract of Belladonna. Atropia.

DOSE.—The dose of the tincture will vary from the fraction of a drop to five drops. For its specific use we add gtt. v. to gtt. xx. to water ℥iv., and give a teaspoonful every hour. The extract may be used in doses of from gr. 1-20, to gr. 1-2, according to the action desired. The dose of Atropia is from gr. 1-100 to gr. 1-20.

SPECIFIC INDICATIONS.—The patient is dull, inclined to sleep, the eyes are dull and pupils dilated—the condition of congestion of the brain, of which coma is a further symptom. Impairment of the capillary circulation with congestion, in any portion of the body, is an indication for Belladonna. The skin is red, and the finger drawn across it leaves a somewhat permanent white line; dusky redness of the surface from capillary congestion, calls for Belladonna. A very free flow of urine—diabetes insipidus—is an indication, as is deep aching of the loins or back with sense of fullness. A dull heavy headache, with a feeling that the person could go to sleep if it were not for the pain, is a common indication.

Therapeutic Action.—Belladonna is sedative, narcotic, antispasmodic, diaphoretic and diuretic, and is a powerful narcotic or cerebro-spinant. It greatly diminishes the sensibility and irritability of the system when morbid states obtain, and in the healthy state its effects are as follows. It occasions dryness of the mouth and throat, thirst, visual illusions, dilated pupils, giddiness, delirium, singing in the ears, or impaired hearing, numbness of the face, difficult deglutition, and articulation, sense of constriction about the throat, nausea, occasionally vomiting, a cutaneous eruption like scarlatina, and an increase of the cutaneous, renal and mucous secretions.

If the quantity taken be large, the pupil becomes largely dilated and immovable, and the eye quite insensible to light, conjunctiva injected, tongue, palate, and throat dry, deglutition difficult, nausea, prostration, difficulty or inability to maintain the erect position, constant movement of the hands and fingers, delirium or intoxication, a red and tumid face, sometimes fits of laughter, and sometimes furious delirium; finally the patient becomes comatose, the stomach and bowels lose their impressibility or normal sensibility, and the whole nervous system seems to be paralyzed. "A feeble pulse, cold extremities, subsultus-tendinum, deep coma or delirium, and sometimes convulsions, precede its fatal termination."

In the modern practice of medicine we employ it as a remedy for congestion. It stimulates the capillary blood-vessels in all parts of the body, but more especially in the brain and spinal cord.

In congestion of the brain it has no equal. The patient is dull, and inclined to sleep most of the time, the face is dull, expressionless, the eyes are dull, the pupils are dilated. Where the face is flushed the color is dusky. This it will be remembered is a common complication in the acute diseases of children, and with the old means of cure are unfavorable conditions. We meet this condition now with small doses of Belladonna, gtt. v. to gtt. x., water ʒiv.; a teaspoonful every hour.

In very small doses, gtt. ij. to gtt. v. to water ʒiv., a teaspoonful every four hours, it is a prophylactic against scarlet fever Not that it will antidote the contagion in all cases, for we must be satisfied if it will do it in a part. I have been called to a first case of scarlet fever in a family of four to eight children, and with the prophylactic administration of Belladonna, have had no other cases, or but one or two more. I have used it in my own family with these results.

But if it does not prove prophylactic, it will have done no harm, and indeed I have thought when Belladonna had been taken the disease was much milder.

Belladonna is a valuable remedy in diabetes insipidus, and even in diabetes mellitus it checks the flow of urine in some cases. It relieves the unpleasant sense of fullness and weight in the loins and the weak back. In some cases a Belladonna plaster applied to the back across the loins, will have this effect.

It is a valuable remedy in sore throat, whether diphtheritic, scarlatinal, or the ordinary sore throat. For this purpose it may be administered with Aconite, Phytolacca, or alone.

In chronic disease of the brain, with sense of fullness, dizziness, drowsiness, dull heavy aching, it is an admirable remedy. It is to be thought of when indications of apoplexy are observed, there being the dull eye, dilated pupil, and drowsiness.

It is the remedy for headache, when the pain is dull and heavy, and the patient feels sleepy.

STRAMONIUM.

THE LEAVES AND SEEDS OF DATURA STRAMONIUM.—U. S.

Preparations.—A tincture of the fresh leaves. An ointment of the fresh leaves.

Dose.—The dose of the tincture will be from the fraction of a drop to five drops.

Specific Indications.—Acute delirium (maniacal), when the patient is passionate and violent. The patient can not control his temper, feels an almost uncontrollable desire to destroy something, or injure somebody.

Therapeutic Action.—Stramonium is described as narcotic, antispasmodic, sedative, and anodyne; it is a powerful narcotic poison, closely resembling the Belladonna in its effects on the system. In small and repeated doses it lessens the sensibility and often alleviates pain, but does not induce sleep. By mitigating pain, however, and tranquilizing the system, it may indirectly dispose to sleep, but it can not be regarded as a soporific.

If the dose be large, it causes thirst, nausea, vertigo, headache, dimness or perverted vision, dilated pupils, dryness of the throat, sensation of suffocation at times, with peculiar deranged sensations about the fauces, œsophagus and trachea, nervous agitation or disturbed state of the cerebral functions, and may cause diaphoresis, diuresis, and relaxation of the bowels. The pulse is but slightly affected. "In fatal doses the leading spmptoms are flushed countenance, delirium (usually maniacal), dilatation of the pupil, dryness of the throat, loss of voice, difficulty of deglutition, convulsions, and, in some cases, palsy." If the dose is not excessive these effects subside in five or six hours. If the dose is large, it may cause stupor, convulsions and death.

The diseases in which it has been employed with most advantage are those of a nervous character, as neuralgia, or tic-douleureux, mania, epilepsy, etc. In rheumatism, sciatica, etc., it often affords relief, and in spasmodic pain of the bowels, unattended with inflammation, and in syphilitic pains it has been found useful as an anodyne. It has acquired considerable reputation in mania and epilepsy. A large number of cases of the two diseases are reported, in which it is said to have either cured or greatly mitigated the attending symptoms.

It has been found useful in dysmenorrhea, when attended with nervous irritation. In some cases it affords prompt and permanent relief. The *seeds* of Stramonium are esteemed valuable to prevent abortion, it has been found to give speedy and certain relief, by Prof. Baldridge, Dr. Wade and others. Dr. Wade asserts he has used it in cases attended with violent bearing-down pains and every symptom of a speedy abortion, with perfect success.

We employ it now as a remedy in the maniacal delirium that is sometimes met with in fevers and inflammations. This is a very unpleasant complication, and in zymotic fevers almost invariably fatal under the ordinary treatment. Five to twenty drops may be added to a half glass of water; and give in teaspoonful doses every half hour or hour.

The dried leaves are smoked for asthma. Fomentations of stramonium leaves hot are used in the early stages of inflammation to relieve pain and check determination of blood. The stramonium ointment is employed as a local application to irritable hemorrhoids, and especially in that unpleasant hypertrophy of the skin about the anus which is attended with pruritus, and sometimes with sero-purulent secretion.

CONIUM.

THE LEAVES OF CONIUM MACULATUM.—EUROPE.

PREPARATIONS.—Tincture of Conium. Extract of Conium.

DOSE.—From the fraction of a drop to five drops of the tincture. Of the extract, gr. ⅛ to gr. ¼.

THERAPEUTIC ACTION.— Hemlock is narcotic, antispasmodic, sedative, alterative, and resolvent. It is a very powerful narcotic, and when administered in large or poisonous doses, it produces vertigo, dilated pupils, impaired vision, delirium, convulsions, coma, difficulty of speech, tremors, paralysis, and ultimately death. Its *modus operandi* is not exactly understood. On examinations made upon the bodies of those animals destroyed by hemlock, venous congestions, congestions of the cerebral vessels and a fluid condition of the blood, are appearances occasionally presented.

It is sometimes used as an anodyne and hypnotic in painful glandular enlargements, scirrhous and cancerous ulcers, nocturnal and syphilitic pains, rheumatism, neuralgia, etc., with evident advantage. Enlargement of the viscera, as the liver, spleen, pancreas, mesenteric glands, scrofulous tumors, carcinomatous affections of the breasts, testicles, uterus, and other internal organs, tertiary syphilis, foul and painful ulcers, indurations of glands, obstinate cutaneous diseases, as lepra, herpes, elephantiasis, chronic catarrh, phthisis, bronchocele, etc., are a few of the numerous diseases and cachectic and depraved states of the system in which the hemlock has and may be administered, with a view either to its palliative or curative action.

CANNABIS.

THE RESINOUS EXUDATION FROM THE PLANT CANNABIS INDICA.—Asia.

Preparation.—A tincture is prepared from the *Gunga* or *Churrus* imported from India.

Dose.—The dose will vary from the fraction of a drop to five drops. In the majority of cases gtt. xx. is added to water ℥iv., and given in teaspoonful doses every two to four hours.

Specific Indications.— Burning in the urethra and throughout the urinary tract. Frequent micturition with burning. Excitement of the reproductive function with erections, lascivious dreams and thoughts. Chordee. Gonorrhœa.

Therapeutic Action.—Indian Hemp is said to be narcotic, anodyne, antispasmodic, sedative, and aphrodisiac. It has been used mostly as a sedative in painful spasmodic affections. In neuralgia, sciatica, and chronic rheumatism, it has been found to be quite efficient. In convulsions, coughs, asthma, and pertussis, it is said to mitigate the urgent symptoms. It enjoys some reputation as a curative agent in tetanus and hydrophobia, owing to its sedative action.

We employ Cannabis principally in the treatment of gonorrhœa, where it exerts a most marked influence. In the early stage of the disease it is given with Veratrum or Gelseminum, in a later stage with Macrotys. In some cases it promptly arrests the disease, in others its action is slow, but I prefer it to the old-fashioned copaiba and cubebs.

If one will carefully note the indications as given, they will see that its use may be extended to wrongs of the reproductive functions and to diseases of the bladder and prostate gland. I have found it useful in some diseases of women, where hyperæsthesia of the genitals was a prominent feature.

TABACUM.

THE LEAVES OF NICOTIANA TABACUM.—U. S.

Therapeutic Action.—Tobacco is described as narcotic, sedative, antispasmonic, emetic, diuretic, laxative, errhine, sialagogue and discutient.

In over-doses it is a powerful acro-narcotic poison. In smaller doses it produces a sensation of heat in the throat and warmth in the stomach, with nausea, diuresis, and sometimes purging. It also quiets restlessness, calms mental and corporeal inquietude, and produces a state of general languor or repose. If applied to the nose, it excites a copious flow of mucus, or if chewed, the flow of saliva is greatly increased. In larger doses it produces extreme nausea and vomiting, purging, great prostration, and other symptoms indicative of its violent acro-narcotic qualities, such as languor, muscular relaxation, trembling of the limbs, faintness, great anxiety, impaired vision, confused intellect, pulse small and feeble, respiration laborious, cold and clammy state of the surface, and in extreme cases convulsions, alarming and even fatal prostration. The most common symptoms are nausea, vomiting, in some cases purging, relaxation of the muscles and extreme prostration, with great depression in the action of the heart and arteries, manifested by a feeble pulse, paleness of the face, cold sweats, tremors, paralysis, stupor, etc. Its primary action is upon the brain and nervous system, as is manifested by its capacity to reduce first the nervous, and secondly the vascular powers. This view of its action is demonstrated by the experiments of Sir B. Brodie, who, after decapitating animals, injected an infusion of tobacco into the rectum, and kept up artificial respiration, and thus sustained the action of the heart and arteries, while an equal quantity of the poison injected into the rectum of a healthy animal, or introduced into the stomach, soon paralyzed the heart and caused death.

It is liable to produce the effects stated, when used to excess, by taking it into the stomach, smoking, using it in the form of injections, or applying it to the abraded surface. The practice of chewing and smoking, now so common throughout the world, is the most disgusting, filthy, and loathsome of any to which the perverted taste of man can become habituated. These vices, so highly relished by many, are quite as obnoxious to others; and if we say nothing about the dyspepsias which they occasion, or the disordered innervation, emaciation, general debility and nervous prostration, with a train of sympathetic derangements which they produce, there is still enough to call loudly for reformation.

Tobacco is a potent agent in spasmodic colic, ileus, strangulated hernia, obstinate constipation from peritoneal inflammation and other causes, employed in the form of enemata. It should be employed very cautiously, at first very small portions being used.

In incarcerated hernia, it is a remedy of great power. The tension of the parts is soon removed, the tumor becoming soft and relaxed. "In colic from lead, and in obstinate constipation from spasmodic constriction, the tobacco clyster has sometimes proved most beneficial."—*Pereira.*

In dysentery, the tobacco injection is said to afford great relief.—*Dr. O'Brien.*

In lead colic, compresses, soaked in a decoction of tobacco and applied to the abdomen, have been recommended by Dr. Graves.

In tetanus, the tobacco clyster has often proved valuable, having afforded relief after other means had failed.

In periodical epilepsy, by the application of the tobacco cataplasm to the scrobiculus cordis before the paroxysm, it was prevented. The cataplasm, applied to the throat in spasm of the rima glottidis, gave relief.—*Dr. Wood.*

In spasmodic asthma, either smoked or taken internally, in nauseating doses, it often affords relief.

As a topical remedy, it is anodyne and sedative, and as such may be used in neuralgia, rheumatism, gout, glandular inflammations and swellings, as the testicles, buboes, scirrhous and scrofulous tumors, erysipelatous inflammations, phimosis and paraphimosis, painful hemorrhoidal affections, etc.

CAMPHORA.

THE CONCRETE VOLATILE OIL OF CAMPHORA OFFICINARUM.—ASIA.

PREPARATION.—Tincture of camphor.

DOSE.—The dose will vary from the fraction of a drop to ten drops.

THERAPEUTIC ACTION.—Camphor is described as narcotic, excitant, diaphoretic, antispasmodic, anodyne, anthelmintic, expectorant and rubefacient. While some describe it under the class of Narcotics, others refer it to Stimulants, and others to Diaphoretics or Antispasmodics; while some extend a separate notice to it under each of these classes.

Camphor acts specifically on the nervous system, producing an anodyne and exhilarating influence upon it. In large doses it disorders the mental faculties, external senses and volition, causing lassitude, giddiness, impaired vision, drowsiness, delirium, stupor and convulsions.

In small portions it acts as a vascular excitant, increasing the fullness of the pulse, and somewhat its frequency, and the temperature of the body; and if the surface be kept warm, it promotes diaphoresis, especially if conjoined with opium.

Camphor is sometimes useful in fevers and inflammatory diseases, particularly in low grades, or those of a typhoid character, when attended with a frequent, irritable pulse, dry skin, restlessness, morbid vigilance, subsultus, low muttering delirium, etc. In these cases it determines to the surface, and favors diaphoresis; while it augments the fullness of the pulse without materially increasing its frequency. It likewise lessens or arrests the irregular muscular contractions, and seems to calm nervous excitement, tranquilize the system and dispose to sleep. Its utility in these cases is often greatly increased by combining it with opium, ipecacuanha, carbonate of ammonia, capsicum, or quinine, according to the indication desirable to be fulfilled. It is also valuable in other forms of fevers, either alone or conjoined with other remedies to promote diaphoresis.

LACTUCARIUM.

THE INSPISSATED JUICE OF LACTUCA VIROSA.—U. S.

Dose.—One to five grains.

Therapeutic Action.—Lactucarium is narcotic, anodyne, sedative, diaphoretic, diuretic, hypnotic and antispasmodic. It is a valuable anodyne and palliative in many affections attended with nervous irritation and vascular excitement, when opium is not an appropriate remedy. While opium accelerates the pulse and produces either stupor or delirium, the lactucarium alleviates pain, diminishes the rapidity of the pulse, reduces the animal heat, and disposes to sleep. It is, however, to be regarded as an anodyne and sedative, rather than hypnotic. In these respects its action or effects upon the system resemble those of Hyoscyamus.

HUMULUS. LUPULINA.

THE STROBILES OF HUMULUS LUPULUS.

THE YELLOW GLANDULAR POWDER SEPARATED FROM THE STROBILES.

Preparations. — Tincture of Humulus. Tincture of Lupulin.

Dose.—The dose of the first will be from gtt. v. to ʒss.; of the second, gtt. j. to gtt. x. Of Lupulin grs j. to grs. x.

Therapeutic Action.—In cases of nervous irritability attended with wakefulness, hops are anodyne and hypnotic, and are frequently exhibited to alleviate pain, tranquilize the system and procure sleep; even a pillow filled with hops and moistened with spirits, favors this desirable end. In delirium tremens, morbid vigilance and nervous excitement, they frequently compose the nervous system, while at the same time their tonic and stomachic properties impart increased energy to the organic actions, rendering them of great utility in debilitated and irritable states of the nervous system. Well hopped ale is valuable as a tonic and stomachic, especially in nervous habits, during the convalescence of many diseases, owing to the hops which it contains. The hops (as well as the wort), are thought to be diuretic, and have been employed to correct the lithic acid deposits.

Lupulin may be administered in the same cases in which the hops are recommended. The effects are even more certain, while its exhibition is attended with much greater convenience. In all cases when a feeble anodyne is required, and when opium is inadmissible, this agent is useful, as in spasm of the stomach or bowels, after-pains, and irritable states of the nervous system.

SOLANUM.

THE PLANT SOLANUM NIGRUM.—U. S.

Preparation.—A tincture is prepared from the fresh plant when flowering.

Dose.—The dose will vary from the fraction of a drop to five drops.

Specific Indications.—The room seems to be turning round, and when the patient shuts his eyes, the bed seems as if turning, and he will fall out; dizziness; mind wanders, and patient fears that he will lose it. Skin is flushed red, and the patient sinks into a stupor, with stertorous breathing.

THERAPEUTIC ACTION.—The Solanum is but little used in medicine, though it is a powerful agent, and should be made to serve a good purpose. The indications given will point the way to a better study, when I hope we may be able to define its uses better. There are some chronic diseases of the brain which show the symptoms named, and some acute diseases that give us the peculiar red, hot (and moist) skin, with stupor, that would cause us to select this remedy. It will be noticed that its action is somewhat like Belladonna.

GUARANA.

THE PREPARED SEED OF PAULLINIA SORBILIS.—BRAZIL.

PREPARATION.—Tincture of Guarana.

DOSE.—The dose will vary from one to ten or even twenty drops.

THERAPEUTIC ACTION.—The action of Guarana is somewhat analogous to Caffeine. Its primary effect is that of an excitant to the brain and spinal cord, and this is followed by a sense of exhaustion and a disposition to sleep.

Its principal use thus far has been as a remedy for headache, for which it was advertised as a specific. In my opinion it relieves those cases where we would give ether or ammonia. But I have seen it given in doses so large that the cure might depend upon its secondary narcotic action.

It has also been used and recommended as a tonic, a remedy for dyspepsia, diarrhœa and dysentery, leucorrhœa, and painful menstruation.

TONGA.

IMPORTED FROM FIGII—SOURCE UNKNOWN.

PREPARATION.—Fluid Extract of Tonga.

DOSE.—From ten drops to one drachm.

THERAPEUTIC ACTION.—This agent has been employed in the treatment of neuralgia with great success, and those advertising it claim it to be specific. Dr. Ringer says of it:—

"This remedy, whilst apparently highly useful in neuralgia, produces no toxic symptoms, for we have given two half-ounce doses of the liquid extract at half an hour's interval, and repeated it again in two hours, without producing any effect except slight drowsiness. These doses did not affect the pupil, nor increase nor lessen the secretion of the mouth or skin; neither did they affect sensation of the skin supplied by the fifth nerve.

PLANTAGO.

THE PLANT PLANTAGO MAJOR.—U. S.

PREPARATION.—A tincture is prepared from the fresh plant when coming into flower.

DOSE.—The dose will be from the fraction of a drop to five drops.

SPECIFIC INDICATIONS.—Toothache; the teeth are sore; the tooth becomes sensitive; the jaws ache; pain in the temples, extending to the teeth.

THERAPEUTIC ACTION.—This remedy has been employed for the relief of toothache with most excellent success. The cavity of the tooth is well cleansed, and then filled with cotton wetted with this tincture; a second or third application will sometimes be required before relief is obtained. I have employed it internally for toothache, and for neuralgia associated with toothache. In some cases it has given marked relief when everything else had failed. In all these cases it seems to exert a soothing influence upon the brain, and promotes sleep.

It has been given in incipient phthisis, hemorrhage from the lungs, menorrhagia, leucorrhœa, dysuria, and hemorrhoids.

PISCIDIA.

THE BARK OF THE ROOT OF PISCIDIA ERYTHRINA.—JAMAICA.

PREPARATION.—Tincture of Piscidia—*Jamaica Dogwood.*

THERAPEUTIC ACTION.—It is claimed that the Jamaica Dogwood exerts a marked influence upon the brain, lessening irritation and producing sleep. I have had no experience with the drug, but hope it may not prove like many other new remedies, to have its principal action upon the physicians and druggists' pockets.

POTASSII BROMIDUM

Dose.—From two to thirty grains.

Therapeutic Action.— In moderate doses bromide of potassium lessens the excitability of the nerve centers, quiets pain and produces sleep. In large doses it is an irritant to mucous surfaces, and if continued produces symptoms of bromidism.

Though freely prescribed by many physicians, we think its narcotic power very much over-estimated. If the cases are well selected, and care is used to keep everything quiet, it will cause sleep. It has been combined with chloral, and the combination has been deemed better than the single remedy.

It is recommended in delirium tremens, but will hardly take the place of chloral, or the hypodermic injection of morphia. It is of use in the delirium of acute disease, but is only of advantage in cases showing muscular tremor.

It is a valuable remedy in some cases of cholera infantum, restlessness and sleeplessness being prominent symptoms

CLASS VII.

STIMULANTS.

Stimulants are medicines which produce a temporary increase of one or more of the vital functions. A much more comprehensive signification is often given to this word; thus, the true stimulant, the astringent and tonic, are distinguished as general stimulants, while emetics, cathartics, diaphoretics, diuretics, emmenagogues, sialagogues, errhines, parturients, etc., are termed local stimulants. In this sense every medicine is a stimulant, not excepting, according to many authors, even "*sedatives.*"

But it is not in this wide and indefinite sense that the word can with propriety be used in the classification of remedial agents. The term *stimulant* or *excitant* is here applied to those medicines which produce a temporary increase of the action of the heart and arteries, and in the supply of nervous energy, without any sensible increase in the evacuations or secretions.

The first effects of narcotics are those of stimulation, yet we do not consider them as true stimulants. Many agents, however, which we have classed as stimulants, after exerting their stimulant effect, are followed by nervous depression or sedation; as the alcoholic liquors, etc.

It must be admitted that many of the different classes of remedial agents glide by an indefinable gradation into each other, and partake of the properties common to other classes. It will also be recollected that numerous articles of the materia medica are possessed of a variety of different properties, —thus we often have an agent possessed of stimulant, diaphoretic, diuretic, expectorant and purgative properties. From these remarks it must be apparent to all that our present classification is erroneous, or at least not based upon an unobjectionable foundation. We shall, however, pursue the beaten track, acknowledging at the same time our inability to confine particular medicines to the respective classes under which they may be technically ranked.

Action of Stimulants.—Stimulants belong to the class of *neurotic* medicines; that is, they act upon the nerves, and as we have already seen, the action of such remedies is transient The question has been much discussed, whether stimulants really *exalt* nervous force (increase its quantity), or whether they merely call it forth (expend that which already exists). We are led to believe that stimulants really increase the amount of nervous force; for if they did not, we would always have as a result of their use a depression corresponding with the primary excitation—which is not the case. Again, we may maintain a certain degree of stimulation for an indefinite period by continuing the use of the remedy, which we could not do, if they merely expended nervous force without causing a reproduction of it.

We must, however, carefully distinguish between *nervous* and *vital* force; for nervous force may exist in excess, when the vital force or that power which preserves life, is depressed. "Nervous force," says Headland, "may be very much increased, as in high inflammatory fever, without a corresponding increase of the vital. The advantage of a stimulant is regulated by this rule.—When there is a failure in vital energy, no stimulant will serve to prolong life, for it can not communicate fresh vital power. But there may be no such failure of vital energy, and yet a sudden or accidental deficiency of nervous force may serve to peril the continuance of health, or even the tenure of life. For a certain degree of this nervous force is necessary both for life and health. When it is diminished, all the functions must suffer: when it fails entirely, the circulation must stop and death ensues. It is in these cases that a stimulant medicine is appropriate. It does not do good by communicating vital energy, but by remedying the want of nervous action, by which want the manifestation of the vital energy is subdued. This must always be borne in mind when the applicability of stimulants is under consideration."

The first effect of a stimulant is that of a topical excitant. When taken into the stomach, they stimulate the mucous membrane to increased secretion, and the muscular fibers to greater activity; the food is more readily and rapidly digested, and chylosis facilitated. This local stimulating influence is transmitted to every portion of the body by sympathy, and the whole system participates in the excitation.

All stimulating agents are soluble in the fluids of the body, and are hence absorbed into the circulation, and by it brought into contact with the entire nervous system. These agents, as we have already noticed, prove stimulant to any nerve with which they are brought into contact; thus we have the topical stimulation of the stomach, the topical stimulation when applied to the skin, etc. We thus see that they act directly on nerve-matter, whenever brought in contact with it; and through the circulation they are brought into direct contact with the entire nervous matter of the body. As the result of this, the contractions of the heart are increased in force and frequency, the pulse becomes more energetic and frequent, respiration is accelerated, animal heat augmented, the countenance is enlivened, the intellectual and physical powers increased, and the cutaneous and renal secretions exhibit increased activity. They produce a temporary exhilaration of mind, revive and elevate the spirits—in a word, the phenomena of health are active when the system is under their influence, unless overpowered by disease. In some cases the excitation, when carried too far, or too long continued, may result in febrile or inflammatory action. The super-excitation which follows their too free use, often results in prostration, though this is not always proportioned to the intensity of the previous excitement.

As has been already remarked, many stimulants exert an especial influence over particular secretions, or over particular organs. Thus the carbonate of ammonia is diaphoretic as well as stimulant; the cantharides and juniper diuretic; while the turpentine, gum-resins, copaiba, benzoic acid, etc., though stimulants, exert an especial influence upon the mucous membranes, diminishing excessive secretion — and especially is this the case with the genito-urinary mucous membrane.

Those agents, generally denominated *tetanics*, or muscular stimulants, as the strychnia and brucia, are peculiar agents.

whose excitant influence appears to be exerted upon the motor column of the spinal cord, the motor parts of the brain, and the motor nerves. Thus, in large doses, they cause spasmodic and powerful contractions of the muscles of the body, and they may even produce death in this way, by rendering respiration impossible. In order that these agents should produce their specific effect, two things are necessary: first, that the muscles to be acted upon should be in a normal condition; and second, that the nerves passing from the nervous centers to them must be sound, so as to afford a medium for the passage of the increased nervous current. It is proved that they act upon the nerves, and not upon the muscles, by the fact, that when the nerves are injured, so that they can not convey an impression, these agents have no effect upon the muscles, though every other condition is present.

As has been before stated, the moderate use of stimulants renders digestion more rapid and more perfect, the circulation is more vigorous, and its centripetal or congestive tendency is superseded by the centrifugal, and all the secretions are facilitated. But if they are too freely used, if the dose is large and too often repeated, or administered with any great degree of persistence, their sanative powers are lost, and they become engines of disease. If too freely employed, irritation, or even inflammation may supervene in the organ with which they come in direct contact—or in a neighboring one, and symptomatic fever may result; under which many of the functions instead of being promoted by the stimulant, will be retarded. This is the case with the secretions and excretions generally — they are always deranged during febrile excitement.

Another result follows from exalted organic action, whether t depends upon artificial stimulation, or is the result of disease; that is, the exalted action is always followed by depression to a greater or less extent. This is the case with either mental or physical excitement, prostration being always the result of it, when carried to an extreme. Prostration is always the more marked the greater the stimulation. To a certain point stimulation may be carried without subsequent prostration; but passing beyond this point, we may say that it is proportioned to the amount of stimulation

If one organ is over-excited in any way, some other organ is apt to become equally depressed, or to take on a state of inactivity, atony or debility. We frequently meet with cases of extreme debility of an organ, or of the general system, when the debility is apparent, but not real, some other organ being over-excited, thereby causing the apparent prostration. This is often a nice point to determine in the progress of disease, and one upon which the most expert diagnostician will sometimes err. When the prostration is but apparent, and depends upon some local and deep-seated congestion or inflammation, which is oppressive to the vital powers, a course of depletive medication, instead of increasing the debility, will often increase the strength, by removing the congestion or cause of oppression, and apparent debility: whereas, if the debility had been real, the same mode of medication would have destroyed the patient.

The morbid condition, atony or debility of one organ induced by over-excitement of another, arise from the withdrawal of the due nervous impressibility and diminished vascular stimulus from the atonic organ, by its concentration upon the one undergoing the undue and artificial stimulation. There are numerous cases in which excitants are of great importance, yet the extent of excitation indicated in disease, is a matter of interest to the physician as well as to the patient; for it must be confessed, the general tendency of the too free and protracted use of this class of agents is to impair the vital energies of the general system, when general stimulants are used, or of particular organs, when special ones are used, and finally, to wear out the natural sensibility and excitability of the organ, or even the whole system.

It may be asserted, we think, as an axiom, which can not be controverted, that *super-excitation* in a single organ, or in the whole system, whether it is dependent upon excrementitious matter retained in the system, and acting as a source of irritation, or is the result of incessant heating or stimulating medication, is always compensated for by a corresponding loss of action in some other organ or organs, or even in the entire system, and ultimately, with a diminution of the activity, or even the entire loss of the functions of the organ upon which this super-excitation or undue stimulation has been made.

From the foregoing remarks, it must appear evident that the long-continued use of stimulants of a hot and very exciting character, must be attended with great injury. There are some classes of physicians who make the stomach the great theater of therapeutic action—the organ which is made to receive the major part of all their impressions, and the one upon which the nervous and vascular action is concentrated by the unbalancing weight of their whole mode of medication. This organ is first distended and relaxed by enormous quantities of hot fluid, strongly charged with capsicum, or the "composition powder," which renders it the great central organ of sympathies, a center of fluxion,—one upon which the vital energies are concentrated, while other organs are deprived of their ordinary vital afflux by the abstraction or destruction of the equilibrium just referred to. These pungent, acrid, heating medicines acting upon this relaxed and now morbidly sensitive organ, and followed up for from six to twelve hours, and repeated daily for weeks, and even months, sometimes until "*three hundred courses*" of the kind are gone through with, can not fail to debilitate the stomach and wear out its natural sensibilities, and produce those of an abnormal character, together with an irritation and thickening of the mucous coat, and a permanent chronic phlogosis. In this way the normal sensibility of the stomach is blunted, and often destroyed; while other organs lack innervation from the undue concentration which has there taken place. Chronic gastritis and dyspepsia are two very common forms of disease which result from the repeated and long-continued use of these pungent acrid excitants. The skin is another tissue upon which they act so frequently, and with such vehemence, that they often destroy its normal functions and produce a state of innervation, or loss of vital energy, incompatible with a state of health in other organs or parts of the system.

We do not deny that these measures are capable of exerting a very powerful influence over many morbid and diseased states of the system; on the contrary, we know that this is the case. We also admit that, through these influences, the functions of many other organs are frequently restored or improved; but we object to this course of medication, because the great burden of removing disease is imposed upon one or two organs. Instead of dividing the influences, and throwing the burden alternately upon different organs and emunctories, one or two are made to perform the eliminating functions which should fall upon all.

Another class of physicians pursue a very different mode of medication, and one that unbalances the normal conditions of particular organs, as well as the general system, and proves far more detrimental to the unfortunate victims upon whom its blighting influences are exerted, than the once popular "course" just alluded to.

It has been the practice with these physicians to administer mercury in all diseases to which man is heir, for the purpose of stimulating the liver to increased secretion, and through the diseased condition of this viscus, thus produced, remove the disease. Nothing could be more absurd than such practice; for in the normal condition of the system, this secretion is not formed for elimination, but to answer a further purpose in the economy. Though mercury, at this day, is almost entirely discarded by the better informed, yet it is still made the great therapeutic lever by a large class of routine practitioners; while that important gland, the liver, is made the fulcrum upon which their principal curative means are used. With this weapon of destruction they enter the arena of life and death, too often to insure victory to the latter, or to render the constitution a wreck, and the survivor the subject of the physician's care through life. If called to treat a disease, either acute or chronic, symptomatic or idiopathic, neuropathic or asthmatic, febrile or inflammatory, anemia or plethora, dropsy or excessive excretion, such a physician fancies the liver is torpid, and is suffering from some functional derangement or organic lesion. Indeed it matters not what the case may be, that organ is the one which must take on itself the great burden of throwing off the disease. Should it not speedily succeed in doing so, the salivary glands and gums must next receive especial attention. The gums must be "*touched*," and the glands abnormally stimulated, in order to subvert the original diseased condition, by setting up a new and abnormal action in the system, counteracting the original one by substituting its own. To act upon the liver, remove its torpor, increase and regulate its secretions, restrain them if excessive, render them healthy if unhealthy, etc., etc., appears to constitute in the minds of mercurialists the great therapeutic indications to be fulfilled.

As has been before stated, by stimulating one organ, and making it the point of undue excitation, either general or local irritation may supervene, fever may follow, other organs be rendered torpid or debilitated, and this undue stimulation not unfrequently wears out or greatly impairs the liver, if it does not destroy life itself. The continued excitement of this organ by such treatment is one of the most prolific sources of chronic hepatitis, torpor or derangement of that organ, that can be named; indeed, we may safely say that this one agent, so often used, and so entirely depended upon to remove all hepatic derangements, causes more of the identical diseases which it is so often given to remove, than the sum total of all other agencies. The use of mercury to fulfill the indications referred to, is doubtless one of the greatest fallacies of the dominant practice of the nineteenth century, and one which in a future day, and that by no means a distant one, will be viewed as one of the most marvelous and visionary practices that ever obtained countenance from the great mass of the medical profession. Happily even now the more candid professors and practitioners confess that the liver is an organ "*more sinned against than sinning.*"

It is scarcely necessary to refer to the effects of alcohol as a stimulant, as they are known to all. It is an agent capable of doing a great amount of good when judiciously taken, "*in disease*"; but if too freely and too frequently used, and its use persisted in for any considerable length of time, it is capable of doing a more than equal amount of injury. The excitement which it causes in the system is followed by a corresponding loss of action. It produces enervation, atony or debility of some organs, while others are unduly excited; which excitation is succeeded by irritation, chronic inflammation, ulceration, and a thickening of the mucous membrane of the stomach; and finally by an entire loss of its natural sensibilities and functions. Visceral obstructions, dropsies, torpor of the glandular system, phrenitis, apoplexy, etc., are but so many pathological states of the system induced by undue and improper stimulation. All modes of stimulation, if carried beyond a certain point, result in a morbid over-excitement of the organ acted upon, and finally eventuate in the entire loss of its normal sensibility.

THERAPEUTIC INDICATIONS.

In *atonic states of the stomach*, when the mucous and muscular coats have lost their tone, when the food taken produces oppression, when there is flatulence, acid eructations, and the general evidences of dyspepsia, excitants become valuable. If the disease is transient, and arises from previous over-excitement which has produced a temporary exhaustion, ether, alcohol, wine, the essential oils, capsicum, aromatics, etc., may palliate, or even give entire relief. In the flatulent colic of children, aromatic excitants sometimes give prompt and speedy relief. If, however, these ymptoms are protracted, we may rest assured that it is not a mere temporary loss of nervous energy, but a more permanent disease, in which agents more permanent in their influence upon the system, are demanded. In such cases, excitants combined with tonics comprise our most efficient curative means; gentle stimulation arouses the torpid gastric sensibilities to the influence of tonics, which impart permanent tone to the organ, and often restore it to its normal state.

In *violent spasm of the stomach or bowels*, dependent upon the translation of gouty irritation to these parts, unattended with inflammation, the most diffusible stimulants, either alone or combined with narcotics, are of great importance; external excitants or revellents to the epigastric region are also useful. These combined influences diminish the erythism of the nerves implicated, and frequently give relief.

In *constipation*, not attended with inflammation, excitants combined with cathartics often prove valuable auxiliaries, by stimulating the muscular coat, and thus quickening the peristaltic action of the bowels, facilitating the action of the cathartic. They are also valuable as correctors of cathartic medicines, as they prevent griping. The use of excitants in cases of nausea and vomiting, arising from pregnancy, hardly fails to palliate, and not unfrequently entirely removes these unpleasant symptoms.

Stimulants are important in the *advanced stages of febrile and inflammatory disease*, when a high grade of excitement no longer exists; even when the prostration is not great, if the arterial excitement is not very vigorous, the moderate use of stimulants will often hasten the progress of convalescence. In fevers of an adynamic type, when the prostration is great and the vital powers are apparently nearly exhausted or rapidly sinking, the pulse feeble and thread-like, a cold, clammy sweat, etc., active, diffusible stimulants of the most powerful kind become an indispensable part of the medication—their external employment is also demanded. In typhus and typhoid fevers, where the system is prostrated by the vitiated character of the circulating fluids, and a tendency to putrescence, great advantage is derived from the use of stimulants, either alone or in combination with tonics.

In *passive dropsies*, as auxiliaries to diuretics, they often exert a salutary influence. By their stimulating and exciting powers they impart new vigor to the atonic vessels, and thus counteract exudation.

The same remarks apply to their use in *passive hemorrhages*, indicating great prostration of the vital powers, and in petechia arising from the passive transudation of the diseased and dissolved blood, through the relaxed parietes of the atonic vessels. These hemorrhages are of frequent occurrence in adynamic fevers, typhus, typhoid, and other malignant and putrid fevers, scorbutis, etc.; in which cases the local revellent influence of an active excitant, as the capsicum, together with the increased vital energy which it imparts to the atonic vessels, recommend them to our use.

In *general debility*, torpor or languor of the system, when the circulation is sluggish, in the atony of old persons, and enfeebled and enervated states of the system which occasionally occur in both the old and the young, or which arise as secondary results of other diseases, excitants, alone or conjoined with tonics, are the therapeutic agents upon which our main reliance must be placed.

Paralysis is a disease of the nervous system, in which stimulants, both as internal and external agents, may be used with a prospect of advantage. When, however, the paralytic affection arises from a lesion of the cerebro-spinal axis, congestion or inflammation of those parts, this class of agents are contraïndicated.

A gentle excitant in *hysteria*, may sometimes be used with much advantage; a combination with antispasmodics increases their value. In other nervous affections, palpitation of the heart, headache, delirium tremens, and in all cases where there is either a permanent or transient depression of the vital powers, the diffusible stimulants, as camphor, wine, ammonia, etc., may be used as palliatives, or in some cases as curative agents.

Aromatics are spoken of by some authors as a distinct class of excitants or stimulants, but a distinction of this character is wholly uncalled for. They may be defined to be stimulants possessing a very fragrant or agreeable odor, and which when masticated or taken into the mouth, impart a sensation of warmth and pungency to the taste. Many of these aromatic stimulants are also tonic and astringent.

These medicines are also termed *carminatives*, and are employed very frequently to remove flatus from the stomach and bowels; but this effect depends wholly upon their local excitant influence upon the mucous membrane of the stomach and bowels, and the transmission of that impression to the contiguous muscular coat, from the action of which the expulsion or diffusion of the flatus takes place, and relief follows.

If flatus accumulates in the alimentary canal, the muscular fiber becomes paralyzed from over-distension, the bowels losing their wonted energy and contractile power, are incapable of expelling or diffusing it through the tube; hence the pain in flatulent colic. In this case an aromatic stimulant imparts tone and increased energy to the stomach and bowels, which enables them to contract upon it, and expel it through the cardia or pylorus, if in the stomach; if in the bowels, it causes a diffusion or an expulsion downward.

CONDITIONS CONTRA-INDICATING THEIR USE.

Stimulants are contraïndicated in cases of gastro-intestinal irritation or inflammation. In such cases their administration is attended with increased phlogosis.

In febrile and inflammatory affections, excitants are improper during the early stages, and it is only in the advanced stages of these diseases, after the arterial excitement has been moderated, and rapid prostration is manifestly unavoidable, that they are proper. Even in these cases, if there is pain in the epigastric region, if it is tender to pressure, if the distress is increased by the use of warm drinks, and the edges and apex of the tongue are red and dry, stimulants are highly improper.

In hypertrophy of the heart, in palpitation of the heart, if it depends upon an organic disease of that organ, stimulants are inadmissible.

They are also contraïndicated in phrenitis, apoplexy and congestion of the brain. Under circumstances of this character, their employment would be highly prejudicial to the patient.

In neuralgia, chorea, tetanus, epilepsy, etc., excitants are occasionally used with profit; but as a general rule they are unimportant, and in many cases very prejudicial. In these cases tonics are more permanent in their influence upon the system, and take the precedence over stimulants, especially if coupled with antispasmodics.

CAPSICUM.

THE FRUIT OF CAPSICUM ANNUUM

PREPARATIONS.—The Powder. Tincture of Capsicum.

DOSE.—The dose will vary from one grain to one drachm of the powder, and from one drop to one drachm of the tincture.

THERAPEUTIC ACTION.—Capsicum is stimulant, carminative, rubefacient, and vesicant. In large doses it is a very pungent, acrid stimulant, producing great heat and a sensation of burning in the stomach when swallowed. By Christison it is regarded as an "irritant poison." It acts as a powerful and pure stimulant in arousing the sensibility and promoting the secretion of organs, when administered in small quantities; yet vascular activity does not seem to be augmented in proportion to its local action.

In torpid or lethargic states of the system, and in cases of paralysis depending upon torpor of the nervous system, and not upon organic lesion, it is an appropriate remedy.

In flatulency and indigestion, attended with a languid and feeble state of the digestive organs, it will be found serviceable; it promotes digestion and removes flatulency, by exciting the gastric nerves and stimulating the muscular coat of the stomach to renewed activity.

Agues or intermittents have been arrested by its use, and in protracted cases, when tonics fail to exert their normal influence upon the system, from loss of gastric susceptibility, capsicum constitutes a valuable adjunct to quinine or other antiperiodics by increasing the nervous sensibility of the patient. In habitual or accidental torpor or constipation of the bowels, it serves as a valuable adjuvant to cathartics, stimulating the muscular coat, and augmenting the susceptibility of the intestines to the action of these agents. Capsicum not only increases the activity of cathartic agents, rendering a less quantity of them necessary, but it likewise modifies their action, preventing nausea and griping.

In the collapsed stage of cholera, in yellow fever, asthenic dropsy or asphyxia, it has been found a useful remedy.

When applied to the surface, cayenne pepper acts as a powerful rubefacient and topical excitant, and if long continued, even as a vesicant. For these purposes it is employed whenever an active remedy of this character is required, as in the low forms of fever, comatose states of the system, great torpor or insensibility, and in all cases where an active, speedy, and powerful revulsive application is required, this agent has no superior. It is employed as a topical application to old and indolent ulcers, either by sprinkling it upon the surface or as a cataplasm, combining it with myrrh, hydrastis, and ulmus fulva; it excites the parts to healthy action, and promotes granulation and cicatrization. In cases of great insensibility it may be sprinkled upon a mustard poultice, or a poultice of the Capsicum or the tincture may be applied to the surface previous to the application of the mustard, in order to arouse the sensibility and insure the revulsive and general excitant action of that remedy. It constitutes a valuable adjunct to stimulating liniments.

XANTHOXYLUM.

THE BARK AND BERRIES OF XANTHOXYLUM FRAXINEUM.

PREPARATION.—Tincture of Xanthoxylum.

DOSE.—From ten drops to one drachm.

THERAPEUTIC ACTION.—Xanthoxylum is stimulant, diaphoretic, carminative, sialagogue, and rubefacient. The bark is an active stimulant, causing general excitement, with a sense of heat in the stomach, and a tendency to diaphoresis. It somewhat resembles Mezereum and Guaiacum in its remedial action and adaptation to the relief of disease, but is much superior to either of those agents. It is an excellent remedy in lethargic, torpid, paralytic, and leuco-phlegmatic habits of body, owing to its excitant influence. It has been used with much advantage in chronic rheumatism, and deservedly enjoys a high reputation in domestic practice in the treatment of this disease. In passive dropsies it seems sometimes to be very beneficial, when associated with diuretics and tonics. In languid or atonic states of the digestive organs, it invigorates and promotes the process of chymification and chylification, relieving flatulence, and spasmodic pain in the stomach and bowels.

It is sometimes used as a masticatory in toothache, rheumatic, neuralgic, and paralytic affections about the mouth and throat. It is also employed as a topical application to indolent ulcers, and as a rubefacient in local affections, either alone or in combination with other agents.

The berries possess similar properties to the bark. They have been found highly useful in chronic rheumatism, and in atonic and languid states of the system; also in flatulence, spasm of the stomach and bowels, colic, cholera morbus, etc., and to qualify the action of other remedies, rendering them acceptable to the stomach. They are also especially valuable for their nervine and antispasmodic properties in tranquilizing nervous irritation; Prof. Morrow regarded them of especial value, and possessed of properties of this kind not heretofore appreciated

ARALIA

THE BARK OF THE ARALIA SPINOSA.

Preparation.—Tincture of Aralia.

Dose.—From ten drops to one drachm.

Therareutic Action.—The Aralia Spinosa is stimulant, diaphoretic, alterative, sialagogue and febrifuge. Its properties appear to be those of a stimulant and diaphoretic, and as such it has been principally employed. We have used it mostly in the same cases in which the xanthoxylum is recommended, as a substitute for that agent. It is employed with advantage in chronic rheumatism; and in colic, flatulence, dyspepsia and torpor of the bowels, it will be found a useful stimulant and carminative. Purch asserts that the tincture of the berries is remarkable for relieving rheumatic pains. It has also been employed with advantage in colic. Porcher says it has been successfully used in South Carolina in syphilis, and it was employed by the negroes in snake-bites with success. It has been used in chronic cutaneous diseases, and other affections requiring the use of alteratives, like other species of the Aralia. The tincture of the bark was prescribed with advantage in the cholera. As a general excitant, diaphoretic and alterative, this agent is possessed of active medicinal properties, which should entitle it to greater attention than it has yet received.

ZINGIBER.

THE RHIZOME OF ZINGIBER OFFICINALE.

Preparations.—Powdered Ginger. Tincture of Ginger.

Dose.—From grs. j. to grs. xx.; of the tincture ʒss. to ʒj.

Therapeutic Action.—Ginger is stimulant, diaphoretic, errhine, sialagogue and rubefacient. It is a very energetic stimulant, highly aromatic and carminative, and when taken in small quantities augments the tone of the digestive organs, promotes digestion, and removes or prevents flatulence, spasm of the stomach or bowels, colic, etc.; for these reasons it is much used as a condiment in atonic states of the stomach. It is also much employed to impart warmth and flavor to other medicines, as tonics and purgatives, correcting their action by preventing nausea and griping, and thus rendering them acceptable to the stomach.

PIPER NIGRUM.

THE DRIED UNRIPE BERRIES OF PIPER NIGRUM.

Therapeutic Action.—Black pepper is stimulant, tonic, febrifuge and rubefacient. It is an acrid agent, producing a pungent, burning sensation in the mouth and stomach, which is followed by a glow of heat upon the surface, and increased vascular action; the pulse is accelerated and diaphoresis promoted. It is employed as a condiment with a view to its excitant influence upon the stomach to aid digestion; and in part for its flavor. By some it is regarded as a stimulant to the genito-urinary organs.

Its febrifuge properties are thought by many to be important. The tincture has often been successfully used to prevent the recurrence of the paroxysms of intermittent fever. It has been employed for this purpose by many Italian physicians, with success, and also in the intermittents of the Southern and Western States. It may be advantageously combined with quinine and other tonics in this disease, when accompanied with gastric insensibility.

PIPERIN.

Dose.—Grains vj. to grains viij., in powder or in pills.

This is a crystalizable substance, obtained from the piper nigrum, longum, and even from cubebs; when pure it is white, but, as found in the market, of a straw-yellow color. It is tasteless and inodorous.

It has been recommended and employed in the treatment of intermittent fevers, with some success. We have used it in this class of diseases, where quinine could not be taken, in some cases successfully, but in a majority it entirely failed. It was recommended by Magendie as a substitute for cubebs in blenorrhagia.

OLEUM CAJUPUTI.

VOLATILE OIL OF THE LEAVES OF MELALEUCA CAJUPUTI.

Dose.—From two to ten drops, taken in emulsion or on sugar.

Therapeutic Action.—Oil of Cajuput is a powerful diffusible stimulant, possessing antispasmodic and diaphoretic properties. We have used it with much advantage as a stimulant in typhoid and typhus fevers and malignant scarlatina, and prefer it to any agent of its class, except Xanthoxylum, in these cases. It is also one of our most efficient remedies in painful spasmodic affections of the stomach, and in flatulent colic. As a stimulant in cholera morbus it is not surpassed, if equaled, by any other agent.

Tinctura Cajuputi Composita—(*Hunn's Life Drops.*)—℞ Oils of Cajuput, Anise, Peppermint, Cloves, *aa.* f℥j., Alcohol ℥iv. Mix. This is one of our most efficient and valuable stimulant and antispasmodic preparations. It may be successfully employed for the relief of cramps in the stomach, colic, cholera morbus, etc. It has been very extensively used by Eclectics in the treatment of Asiatic cholera; and probably no agent has proved more successful. In this disease it is administered in doses of ʒj. repeated every ten or fifteen minutes, until spasmodic action is subdued and reaction established. In the collapsed stage the dose may be doubled or trebled. Frequently its use is not only followed by a cessation of the cramp, but also of the discharges, and perfect reaction. In cholera morbus its use is followed by the like good results, not only checking the vomiting, but frequently arresting the diarrhœa.

ARNICA.

THE FLOWERS OF ARNICA MONTANA.

Preparation.—Tincture of Arnica.

Dose.—Tincture Arnica gtt. x., water ℥iv.; a teaspoonful every hour or two.

Therapeutic Action.— From the experiments of Jorg, Arnica possesses acrid properties. "When swallowed it causes burning in the throat, nausea, vomiting, gastric pains and loss of appetite. The active principle becomes absorbed, quickens the pulse and respiration, and promotes diaphoresis and diuresis. Furthermore, it appears to exert a specific influence over the nervous system, causing headache, giddiness, and loss of sleep." Sundelin considers it to be closely allied in operation to Senega, from which he says it differs in its stimulating influence over the nervous system, and in its causing constipation.

"Arnica is indicated in diseases characterized by debility, torpor, and inactivity. It is administered as a stimulant to the general system in various debilitated conditions, and in typhoid fevers; to the nervous system in deficient sensibility, as in amaurosis; to the muscular system in paralysis; to the vascular system and secretory organs when the action of these is languid and requires to have its energy increased." We have also used it with apparent advantage in prostration of the system from injuries, and in concussion of the brain, to promote reaction.

As an external application to injuries of any kind where the soft parts are bruised, it has no superior. It may be applied either in the form of a poultice of the flowers, or the tincture diluted with water as a wet dressing.

MYRRHA.

THE GUMMY RESINOUS EXUDATION OF BALSAMODENDRON MYRRHA.—ASIA.

THERAPEUTIC ACTION.—Myrrh is described as stimulant, tonic, expectorant, emmenagogue, diaphoretic and antispasmodic. We would say it was stimulant and tonic, its stimulating effects being most conspicuous, while its tonic properties next engage our attention.

Taken in small doses, it promotes the appetite and produces gentle warmth in the stomach, aids assimilation, diminishes excessive secretions from the mucous membranes, and invigorates the general system. In larger doses it causes increased fullness and frequency of the pulse, a sensation of warmth in the mucous membrane of the respiratory passages, and increased temperature of the surface. When locally employed it acts as a mild astringent, detergent, antiseptic, topical excitant and tonic.

Myrrh is indicated in enfeebled states of the general system, with weak, vascular action, and in profuse secretions from mucous membranes. It seems best adapted to relaxed and leucophlegmatic habits.

In chronic catarrh, humoral asthma, pulmonary consumption, attended with a profuse or debilitating expectoration, and in cases of profuse secretions from other mucous surfaces, as the bowels and genito-urinary organs, it is advantageously used to lessen the secretion or discharge. It is also used in other conditions of the pulmonary organs where the secretion is abundant, but not readily expectorated, owing to weakness of the respiratory organs, with a view to aid expectoration.

OLEUM TEREBINTHINÆ.

DOSE.—From gtt. v. to ʒj., usually in emulsion.

THERAPEUTIC ACTION.—Oil of Turpentine is described as stimulant, anthelmintic, diuretic, cathartic, rubefacient, antispasmodic, sudorific and emmenagogue. When taken in small doses it creates a sensation of warmth in the stomach and bowels, and after being absorbed excites vascular activity, stimulates the capillary circulation and the different excretory organs. It is cast off by the different emunctories, as the skin, kidneys and lungs, as is manifest by the odor of their secretions. It appears to constringe, or rather to excite the vessels of mucous surfaces, so as to lessen excessive mucous and sanguineous discharges. Its free and protracted use often causes irritation of the urinary organs, and not unfrequently strangury aud bloody urine.

Oil of Turpentine is employed with some advantage in many diseases. As a stimulant in typhoid fevers, especially when accompanied with a tumid or tympanitic state of the abdomen, and ulceration of the mucous membrane of the bowels, it has been esteemed a valuable agent.

In puerperal fever it is a valuable agent, to relieve the tympanitic condition of the intestines. For this purpose it is used as an enema, and as an application to the abdomen by means of flannel cloths wrung out of it warm.

In chronic rheumatism, especially in aged persons, or in languid and atonic subjects, its stimulant and diaphoretic properties render it useful in some cases.

SINAPIS.

FLOWER OF SEEDS OF SINAPIS NIGRA, SINAPIS ALBA.

Dose.—As a stimulant, from grs. x. to grs. xx.; as an emetic, from ʒj. to ʒij.

Therapeutic Action.—Mustard is stimulant, stomachic, emetic, diuretic, laxative, rubefacient, and vesicant. It is an acrid, pungent stimulant, and if taken into the stomach in large quantities it produces a violent burning pain, with purging, and sometimes gastro-enteritis. It acts as a general excitant to the vascular system, and also upon the organs of secretion. Taken in small quantities with the aliment, it exerts a healthful influence over the organs of digestion, promotes the appetite, and aids in the assimilation of articles difficult of digestion.

The whole seeds, either before or after they have been softened by maceration in hot water, may be taken in doses of a teaspoonful once or twice a day as a laxative in torpidity of the bowels; especially if this malady is accompanied with dyspepsia. In the disease last named, we have seen much benefit derived from the use of the white mustard seed whole, one half teaspoonful being taken two or three times a day. In headache arising from torpidity of the stomach, they likewise prove beneficial.

ARMORACIA.

THE ROOT OF COCHLEARIA ARMORACIA.

Dose.—From one-half to one drachm, grated fine.

Therapeutic Action.—Horseradish is described as stimulant, diuretic, diaphoretic, emetic, antiscorbutic, rubefacient, and vesicant. It acts as a powerful gastric stimulant, but its local action greatly exceeds its general excitant influence over the circulation. It promotes the appetite, improves digestion, and facilitates chymification; hence it is a valuable condiment in debilitated states of the primæ viæ.

It has been esteemed useful both as an internal and an external remedy in paralytic and rheumatic affections, and in the treatment of atonic dropsies, it often affords relief. For this last disease it may be used either in simple infusion or cous membranes. It seems best adapted to relaxed and leucophlegmatic habits.

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It has been esteemed useful both as an internal and an external remedy in paralytic and rheumatic affections, and in the treatment of atonic dropsies, it often affords relief. For this last disease it may be used either in simple infusion or combined with juniper berries, pipsissewa, spearmint, the roots of the common white elder, or other diuretics. We have derived much benefit from a combination of all the agents just named as an auxiliary in the treatment of passive dropsies.

PYCNANTHEMUM.

THE PLANT PYCNANTHEMUM PILOSUM.—U. S.

Therapeutic Action.—Pycnanthemum has been but little used by the profession. It is a very agreeable aromatic stimulant and diaphoretic, similar to the pennyroyal or hyssop in its medical properties, but more pungent in taste and excitant in action. We have used it frequently with very gratifying results in cases of colic, flatulency and pain or spasm of the stomach and bowels, and also as a stimulating diaphoretic in colds, rheumatism and pleurisy. Whenever free perspiration is desirable, and especially in those cases where there is a tendency to chilliness, with a languid state of the circulation, a warm infusion of this agent will be found beneficial. It has also been found useful in cases of nausea and vomiting, to allay sickness.

CINNAMOMUM.

THE BARK OF LAURUS CINNAMOMUM.—CEYLON.

Preparation.—Tincture of Oil of Cinnamon.

Dose.—From ten drops to one drachm.

Therapeutic Action.— Cinnamon is stimulant, tonic, stomachic and astringent. It is one of the most grateful of the aromatic stimulants; pleasant to the taste, it produces a sensation of warmth in the stomach, promotes the functions of assimilation, and in full doses acts as an excitant to the vascular and nervous systems. Like other aromatics, its local excitant action exceeds its general influence as a stimulant.

For medicinal purposes it is often added to bitter and tonic infusions and compounds, and also to purgatives, to improve their taste, and prevent nausea or griping. It is useful to allay nausea, arrest vomiting, and prevent flatulence.

As an astringent, it is useful in diarrhœa, especially where a topical stimulant is required at the same time. As a cordial and stimulant, it is sometimes employed in the advanced stages of fever, and becomes especially valuable if there is diarrhœa.

We have used the cinnamon in the form of an infusion with very good effect in checking redundant menstrual and lochial discharges, and also in cases of uterine and other passive hemorrhages. The tincture is deservedly a popular remedy in post partum hemorrhage, and many physicians would not feel safe without this remedy in their cases.

CARYOPHYLLUS.

THE DRIED UNDEVELOPED FLOWER OF CARYOPHYLLUM AROMATICUS.
EAST INDIES.

DOSE.—From five to ten grains.

THERAPEUTIC ACTION.—Cloves are stimulant and carminative. They are among the most stimulating of the aromatic spices, and being possessed of an agreeable taste and odor, are much used as adjuncts to qualify the taste, smell, and action of other classes of medicine. They are, however, sometimes administered as independent remedies, as carminatives and stomachics, to relieve nausea, vomiting, flatulence and pain, and cramp in the stomach and bowels.

Oleum Caryophylli.—Oil of cloves possesses similar properties, but owing to its acridity it is seldom used alone, being employed in most instances as a corrigent of irritating or drastic cathartic remedies, to prevent either sickness or griping. In large doses it would act as an irritant poison. The oil is frequently applied to the hollow of carious teeth to relieve toothache. It is not often used as a rubefacient, notwithstanding its pungent qualities would indicate its topical use, if properly diluted before applying to the surface. **Dose,** from two to eight drops.

PIMENTO.

UNRIPE BERRIES OF EUGENIA PIMENTO.—WEST INDIES.

DOSE.—From ten grains to one drachm.

THERAPEUTIC ACTION.—Allspice is stimulant, diaphoretic, stomachic, and astringent. It is one of the most pleasant and grateful of the aromatic stimulants, but its use as a medicine is quite limited, its employment being mostly confined to culinary purposes. It possesses the aromatic, stimulant, stomachic, and carminative properties of the spices generally, and may be used to excite the gastric nerves, remove flatulence, etc., in relaxed and atonic states of the stomach.

MYRISTICA.

THE KERNEL OF THE FRUIT OF MYRISTICA MOSCHATA.

DOSE.—From five to twenty grains.

THERAPEUTIC ACTION.—Nutmeg is stimulant, carminative, aromatic, and narcotic. The activity of both nutmegs and mace reside in the volatile oil which they contain. In addition to their aromatic and excitant properties, they possess considerable narcotic power.

Nutmeg is sometimes employed with advantage in uterine hemorrhage, equal parts of pulverized alum and nutmeg, in doses of from five to ten grains, being quite an efficient remedy.

CARDAMOMUM.

THE SEEDS OF ALPINIA CARDAMOMUM.—INDIA.

PREPARATION.—Tincture of Cardamomum.

DOSE.—From ten drops to one drachm.

THERAPEUTIC ACTION.—Cardamom is an aromatic stimulant carminative, with slight tonic and nervine properties.

It is useful in flatulency, and pain or spasm of the stomach and bowels, especially in infancy. In chronic hysteria and other nervous diseases of debilitated females, whether alone or in combination with more active antispasmodics, it often proves serviceable.

LAVANDULA.

THE FLOWERS OF LAVANDULA VERA.

THERAPEUTIC ACTION.— Lavendar is an aromatic stimulant, carminative and antispasmodic. It is mostly employed for its aromatic stimulant qualities, and for giving warmth and flavor to other medicines. It has been esteemed useful in pectoral affections, and in hysteria and other nervous diseases attended with debility. In spasmodic pain in the stomach or bowels and flatulency, it is a useful remedy.

Oleum Lavandula.—Oil of lavender is stimulant, tonic and carminative, and is sometimes used in hysteria, languor, and headache, but is chiefly used as a perfume for scenting evaporating lotions, ointments, and liniments. Dose, one to five drops.

Tinctura Lavandula Compound.—℞ Oil of Lavender, fʒiij.; Oil of Rosemary, fʒj.; Cinnamon, bruised, ℥j.; Cloves, bruised, ʒij.; Nutmeg, bruised, ℥ss.; Red Saunders, rasped, ʒiij.; Rectified Spirit, Oij.; macerate for fourteen days, express and filter. This is a very pleasant and useful stimulant in nausea, flatulence, pain in the stomach and bowels of chidren. Dose, gtt. ij. to fʒss.

ANETHUM.

THE SEEDS OF ANETHUM GRAVEOLENS.

DOSE.—Of the pulverized seeds, from grs. xx. to ʒj.; of the oil, gtt. ij. to gtt. v.

THERAPEUTIC ACTION.—Dill seeds possess the properties common to the aromatics. As a remedial agent they are feeble in action, and are mostly used for the relief of infants affected with colic, flatulence, etc. They have also been used in cases attended with a scanty flow of urine in infancy, and as a pectoral in pain in the chest.

Fœniculum, Coriandrum, Carui, Dauci, and Angelica, (the seeds,) are aromatic stimulants, possessing similar properties to those last described, and may be used for the same purposes; they are, however, not much used at present.

ANISUM.

THE SEEDS OF PIMPINELLA ANISUM.

DOSE.—From twenty grains to one-half drachm in powder.

THERAPEUTIC ACTION.— Anise is an aromatic stimulant and carminative. When taken it imparts its odor to the pulmonary, renal, and mammary secretions. By some it has been supposed to promote the secretion of milk, urine, bronchial mucus, and menses. It is often used in flatulent colic, and pain in the stomach and bowels, to which infants are subject. Combined with cathartics, it tends to prevent nausea and griping.

Oleum Anisi.—Oil of Anise posseses all the properties of the seeds, and is used for the same purposes. It is often associated with Lobelia, Sanguinaria, Ipecacuanha, and other nauseating expectorants, to conceal any unpleasant taste, and render them less obnoxious to the stomach, and at the same time improve their pectoral qualities. In the preparation of cough mixtures, it is very useful both as a corrigent and auxiliary to the compound. It may be combined with Copaiba, and used in chronic catarrh and disease of the urinary organs. Dose, five to ten drops.

ANGELICA.

THE PLANT ANGELICA ATROPURPUREA.—U. S.

Dose.—Of the powdered herb, from grs. xx. to ʒss. Of an infusion of one ounce to a pint of boiling water, f℥j. to f℥ij.

Therapeutic Action.—Angelica is an aromatic stimulant, carminative, diaphoretic, diuretic and emmenagogue. This article is said to possess properties similar to those of the cultivated or garden Angelica.

It is an excellent aromatic stimulant and carminative, and is especially useful when combined with tonics in cases of indigestion, flatulence, etc., depending upon an atonic state of the stomach, and when connected with general debility. It is also an excellent remedy in flatulent colic and cardialgia. It has the reputation of being diuretic and emmenagogue.

LIGUSTICUM.

THE PLANT LIGUSTICUM LEVISTICUM.—Europe.

Therapeutic Action.—Lovage is stimulant, carminative, and diaphoretic—properties similar to the Angelica. It is mostly exhibited in flatulency, pain in the stomach and bowels, and enfeebled states of the stomach, as an aromatic stimulant and carminative. It has been esteemed diaphoretic and emmenagogue, and used to promote these secretions. Used in infusion.

HERACLEUM.

THE ROOT OF HERACLEUM LANATUM.—U. S.

THERAPEUTIC ACTION.—Heracleum is stimulant, carminative, and according to Christison and Griffith, diuretic, expectorant, and antispasmodic. It has been found beneficial as a stomachic and carminative in dyspepsia, attended with cardialgia and flatulence, and has been used in epilepsy.

The leaves have been employed externally as a rubefacient; and when made into a cataplasm, form a good application to maturate abscesses.

MENTHA PIPERITA.

DOSE.—The infusion of Peppermint may be freely taken. The dose of the oil, which is used for the same purposes, is from two to five drops; of the spirit of Peppermint, f℥ss. to f℥ij.; of the essence, gtt. x. to gtt. xxx.

THERAPEUTIC ACTION.—Peppermint is an aromatic stimulant, carminative, antispasmodic, and diaphoretic. It is one of the most grateful of the aromatic stimulants, and is much used to expel flatus, obviate nausea, and relieve spasmodic pains in the stomach and bowels, and to disguise the taste and correct the nauseating or griping effects of other medicines. For purposes of this kind, few articles equal and none surpass it. It is an efficacious carminative and stomachic, and as such is employed with benefit in gastrodynia, flatulent colic, spasmodic and griping pains in the stomach and bowels, etc. As an adjuvant or corrigent, it is highly esteemed for rendering less pleasant medicines acceptable to the stomach.

In cases of extreme irritability of the stomach, an infusion, or a few drops of its essence, often abates the nausea, and hence its use in cholera morbus, cholera infantum, and even in spasmodic cholera. The green herb bruised and applied over the epigastrium at the same time will prove a valuable auxiliary; its action is much aided by wetting it with spirits, or in some cases with laudanum. A strong infusion, taken warm, constitutes an excellent stimulating diaphoretic in colds and the early stages of febrile and inflammatory diseases.

ORIGANUM.

Origanum, or common Marjorum, is a very mild and agreeable aromatic stimulant, and is sometimes administered as a diaphoretic. Its infusion has been administered in chronic cough, asthma, and amenorrhœa. It is a feeble agent, and but little used.

Oleum Origani.—This oil is very acrid, and a powerful stimulant, and is used only as an external application. It is used in this way to relieve sprains, bruises, paralytic and rheumatic affections, and applied to carious teeth to check toothache. Combined with sweet oil, it is applied to prevent alopecia, or baldness.

ROSMARINUS.

Rosemary is stimulant, carminative, emmenagogue, and antispasmodic. It is employed as a gentle stimulant in pains in the stomach and bowels, and as a diaphoretic in colds and the incipient stages of fever. The infusion may be taken freely.

OCIMUM.

Ocimum Basilicum, or Basil, possesses the general properties of the labiate plants already described, and is used for the same purposes.

WINTERI.

DOSE.—one-half to one drachm in powder.

The bark of Drymus Winteri is an aromatic stimulant and tonic, and may be used in cases in which canella and cinnamon are indicated. It was highly extolled by its discoverer, Winter, as an anti-scorbutic. It is, say Christison and Griffith, an excellent aromatic, and well deserving attention, had we not so many similar remedies.

SOLIDAGO ODORA.

The leaves of the sweet Golden Rod are mildly excitant and agreeably aromatic. They are occasionally used in flatulency, colic, etc., as a carminative. The infusion constitutes a very pleasant diaphoretic and diluent. It imparts an agreeable flavor and odor to less acceptable medicines, and corrects their nauseating and irritating qualities. The infusion may be taken freely.

CANELLA.

Dose.—From ten grains to half a drachm.

Canella bark is an aromatic stimulant and mild tonic. Its aromatic and stimulant properties are dependent upon a volatile oil and resin which it contains; its tonic properties on its bitter extractive principle. As an aromatic and carminative agent, it is intermediate between cloves and cinnamon, and quite similar to ginger.

ACORUS.

Dose.—From twenty grains to one drachm.

The common Sweet Flag, or Calamus, is an aromatic stimulant and mild tonic. In its action it resembles Canella and Angelica. It is but little used by the profession, but might be substituted for the more costly imported aromatics. It has been used in asthenic fevers attended with great prostration and weakened digestive powers, and is occasionally used in the treatment of intermittents.

SASSAFRAS.

The bark of the root of Sassafras is an excitant diaphoretic, alterative, and said to be antiseptic. It appears to possess the properties of an excitant, with a tendency to the surface. Its infusion forms a very good diluent and diaphoretic in the eruptive fevers. As a domestic remedy it is employed as a diet-drink for its supposed alterative influence in scrofula and cutaneous diseases.

AURANTIUM--LIMONIS.

The cortical portion of both the sweet and bitter orange and the lemon are mildly stimulant, tonic, and stomachic, and may be used in mild cases where such an action is desired. They are principally used to flavor, and cover the taste of disagreeable agents.

MENTHA VIRIDIS.

DOSE.—The infusion may be taken *ad libitum*. Of the oil the dose is from two to five drops.

THERAPEUTIC ACTION.—This agent is described as stimulant, carminative, diuretic, diaphoretic, tonic, emmenagogue, anthelmintic, and antispasmodic. It is employed to expel flatus, check nausea and vomiting, and alleviate spasmodic pains in the stomach and bowels, but for these purposes it is not as good as the peppermint. It is, however, much more efficient as a diaphoretic, and the warm infusion may be used with advantage in colds, the early stages of fever and acute inflammation. It is especially applicable in cases attended with nausea, or an irritable state of the stomach.

Spearmint is useful as a diuretic in cases of suppression or retention of urine, and in irritation of the genito-urinary organs.

SALVIA.

THE PLANT SALVIA OFFICINALIS.—EUROPE.

DOSE.—The infusion may be taken freely.

THERAPEUTIC ACTION.—Sage is described as stimulant, tonic, astringent, diaphoretic, antispasmodic, and anthelmintic. It is mildly excitant, and feebly tonic and astringent. It may be used in atonic states of the stomach, attended with flatulency, as a carminative, and in colds, coughs, etc., as a diaphoretic and pectoral. In the form of cold infusion it has been found useful in checking night-sweats—a result attributable, probably, to its astringent and tonic properties.

MONARDA.

THE PLANT MONARDA COCCINIA.—U. S.

DOSE.—The infusion may be taken freely.

THERAPEUTIC ACTION.—Monarda is stimulant, carminative, diuretic, diaphoretic, emmenagogue and rubefacient. It is a powerful excitant and carminative, and may be advantageously used in depressed or typhoid states of the system, attended with sinking of the vital powers, with internal congestions, and a cold, pale, and shriveled state of the surface.

It is likewise an efficient stimulant diaphoretic, and may be used in all cases where an agent of this character is indicated.

The Monarda Punctata and Didyma possess similar properties, and may be used for the same purposes.

HYSSOPUS.

The flowering summits and leaves of Hyssop are gently excitant and diaphoretic. It is mostly used as a warm, stimulating diaphoretic in colds, coughs, catarrhal affections, and simple forms of disease where sweating is desirable. For this purpose the infusion may be drank freely.

CUNILA.

The medical properties of Dittany are analogous to the mints and other labiate plants. It is also said to be nervine and emmenagogue. The warm infusion is usefully employed in colds, slight fevers, rheumatic affections, etc., as a stimulant diaphoretic.

THYMUS.

Thyme possesses properties similar to the agents just considered. It is seldom used in regular practice. As a domestic remedy, a warm infusion is often employed in colds, painful and difficult menstruation, to promote perspiration. The infusion may be drank freely.

SATUREJA.

Summer Savory possesses properties similar to the Thyme. It is a gently stimulating diaphoretic, and may be employed in colds and in mild forms of disease to promote perspiration. The infusion may be taken freely.

MELISSA.

Balm is said to be mildly stimulant and diaphoretic. It is very mild in its action upon the system, and its infusion is used in febrile and inflammatory diseases as a diluent, or to promote the action of diaphoretics.

COFFEA.

The untorrified Coffee is said to possess tonic and febrifuge properties. It was employed by Dr. Grindel, of Russia, and Raspari, as a substitute for Cinchona in intermittents; it is not, however, regarded as of much benefit in such cases.

An infusion of roasted coffee is a pleasant, though mild, stimulant and anti-soporific. It is, however, in too general use to be employed as a stimulant, most persons being so accustomed to its use that it produces but little effect as an anti-soporific. It is useful, and should always be employed in cases of poisoning by opium.

THEA.

Tea is a very mild stimulant; and when an infusion is drunk warm, the water and warmth will produce diaphoresis. It is also astringent, and is employed as an antidote in cases of poisoning by vegetable alkalies or the tartrate of antimony. The strong infusion is a very useful remedy in otorrhœa, injected into the ear, and sometimes proves effectual when other remedies have failed. It has also been used with advantage as a collyrium in ophthalmia.

CAMPHORA.

Camphor, described under the head of Narcotics, deserves a notice in this place, on account of its stimulant properties. As a stimulant it is particularly useful in the advanced stages of continued fevers of a typhoid type, when attended with great depression of both the nervous and vascular systems. When the pulse is frequent, small and feeble, with an excited, irritable or jarring beat, dry skin, or a cold and clammy state of the surface, with low muttering delirium, subsultus tendinum, and other evidences of approaching dissolution, camphor has proved a remedy of importance.

ALCOHOL.

Physiological Effects.—Alcohol, or Rectified Spirit, acts locally as an irritant and caustic poison. It causes heat, pain, redness and inflammation, with a condensation of the part to which it is applied. Its effects are chemical; it coagulates the liquid albumen or fibrin, and thereby increases the firmness and density of the tissues to which it is applied, while the irritation and inflammation which it causes arises in part from the resistance or reaction of the vital powers to the chemical action of the poison. In addition to its chemical action upon the albumen and fibrin, its highly pungent and local excitant properties are sufficient to produce irritation and inflammation on the surface where applied.

The remote effects of alcoholic liquids upon the system are subdivided according to the intensity of its action.

Its first and mildest degree of action is manifested by its excitant influence over the arterial and nervous systems. Frequency and fullness of the pulse, with a flushed face, an animated countenance, intellectual or mental excitement, with increased acuteness of ideas, and a joyous state of feeling, are among the first or primary effects of this agent. The individual becomes loquacious, and often very indiscreet in his language. While one drinks to drown his cares, another drinks to give him courage, and another that he may the better enjoy the society of his friends.

The second degree is characterized by an impaired state of the intellectual functions and powers of volition commonly called drunkenness or intoxication.

When in this state the individual becomes delirious, and loses the power to control the action of the voluntary muscles. Increased vascular excitement with frequent nausea and vomiting, are usual concomitants of this state, which is soon followed by a disposition to sleep, which is attended with copious perspiration. Headache, disgust for food, thirst and lassitude, are some of the symptoms manifested upon his recovery from sleep.

The third degree is attended with a state of coma or true apoplexy, when the face becomes livid or pale, respiration is stertorous, and the mouth frothy. This condition results from the ingestion of large quantities of it in a short space of time. In this state the secondary or sedative influences of the agent are clearly and unmistakably manifested. The pulse is slow, full and laborious, respiration slow, and the pupils mostly dilated, and in some cases convulsions ensue. In some instances true apoplexy supervenes, either attended with or without sanguineous extravasation. A paralytic state of the muscles of respiration, or a closure of the glottis, is supposed to constitute the real cause or causes of death.

The moral degradation which it causes is often truly deplorable; while the morbid effects resulting from its continued use are very numerous; among which may be named *delirium tremens*, *insanity*, disease of the liver, such as a tuberculated state of that organ, scirrhous induration, torpor, enlargement, jaundice, and visceral obstructions.

Those addicted to the intemperate use of ardent spirits are particularly liable to disorders of the stomach, such as impaired appetite, dyspepsia, chronic gastritis, and even scirrhus of the pylorus.

A diseased state of the kidneys, general dropsy, melancholia, etc., are a few of the many morbid states of the system consequent upon the improper use of alcohol. Its free use often develops new diseases, or renders old ones incurable, by enfeebling the constitution and rendering it incapable of withstanding the necessary mode of medication. On these latter causes its mortality principally depends.

Alcohol is absorbed into the circulation, and in this way it exerts its influence upon the nervous system. That it is absorbed is readily proven from its presence in the blood, urine, bile, serous fluids, brain, liver, breath, etc. It accumulates in the system, and well authenticated cases are reported in which the fluids within the ventricles of the brain possessed the odor, taste, and inflammability of ardent spirits. Dr. Ogston states that, in one instance, he found about four ounces of fluid in the ventricles, possessing all the physical qualities of alcohol.

THERAPEUTIC ACTION.—Spirit of Wine is stimulant, narcotic, antiseptic, rubefacient, refrigerant, astringent, sedative, and diuretic, and is employed both as a medicinal agent and for pharmaceutical purposes.

As a medicinal agent it is seldom employed internally, brandy, gin, wine, or whisky being mostly prescribed when ardent spirit is indicated. Brandy is the kind most frequently used as an excitant. It acts as a powerful diffusible stimulant, and as such it is exhibited to support the vital energies in the advanced or typhoid stages of fevers, also in cases of syncope, languor, and other states of depression. It often affords relief in cases of flatulency, gastrodynia, spasmodic pains in the stomach or bowels, nervous colic, and also when the food is not readily digested and oppresses the stomach. It sometimes relieves nausea and vomiting, particularly in cases of sea-sickness.

VINUM.

THE FERMENTED JUICE OF THE GRAPE.

The wines recommended in medicine are the Sherry, Port, Claret, Catawba and Delaware (*native*), and for some purposes, Champagne. It is important that they should be pure; but as there is so much adulteration of what was at first the juice of the grape, not to speak of fictitious wines which possess none of the properties but the name, we, in this country, find it better to confine ourselves exclusively to native wine, the purity of which is undoubted.

Wine owes its medicinal properties not only to the alcohol which it contains, but also to the acid and extractive matter; the first rendering them stimulant, the second antiseptic and refrigerant, and the third nutritive.

THERAPEUTIC ACTION.—As a remedy, wine is stimulant, tonic and antiseptic, its stimulant properties being less diffusible but more permanent than alcohol; hence the dose is more easily regulated and its effects more certain. It is also antiseptic and slightly refrigerant, properties which render it particularly applicable in ataxic fevers and other diseases in which there is vitiation of the fluids. In all diseases accompanied with much debility, such as cases of extensive ulceration and gangrene, and in the sinking stages of typhus and typhoid fevers, wine is not only one of the best additions to the bitter tonics, but it is a remedy on which alone there is much reliance. In the convalescence from acute diseases it will be found of much advantage in restoring the exhausted health and vigor.

MALT LIQUORS.

Therapeutic Action.—These agents are used as restoratives in the advanced stages of fever, and to support the powers of the system after surgical operations and severe injuries. They are said to be objectionable in cases of asthma and diseased states of the respiratory or digestive organs.

As porter contains a greater amount of the bitter and tonic properties of the hops, and less of the saccharine matter of the malt, it is to be preferred in diabetic and dyspeptic affections. In many cases ale seems to be one of the most congenial tonics that can be used. During the convalescent stage of fever, while the stomach is weak and irritable, and when the vital powers are much exhausted, this answers a valuable purpose in many cases. It acts as a gentle stimulant, abates nervous irritation, restores the appetite and promotes refreshing sleep.

HYDROCHLORATE OF AMMONIA.

Dose.—From five to thirty grains.

Therapeutic Action.—This salt is a mild stimulant, resolvent and alterative, and is employed by continental physicians to fulfill these indications. It is used advantageously in the milder forms of pneumonia and bronchitis, in inflammations of serous membranes, pertussis, mucous diarrhœa, passive dropsies, chronic rheumatism and gout. Neligan states that he has found it useful as a stimulant in some forms of adynamic fevers, and also in sub-acute laryngitis. Mr. Class employed it extensively in the early stages of tubercular phthisis, and, he states, with the most decided beneficial results. We have employed it only in pertussis, in conjunction with belladonna, and in this disease we consider it decidedly beneficial.

Mr. Walker found that five parts each of this salt and nitrate of potash, dissolved in sixteen ounces of water, formed a refrigerant mixture, which reduced the temperature forty degrees. This mixture may be employed in any case where an external refrigerant is indicated.

AQUA AMMONIÆ.

Dose.—The dose of Ammonia is from gtt. v. to ʒss., largely diluted with water.

Therapeutic Action.—The local effects of Aqua Ammonia are energetic; applied to the surface it may act either as a rubefacient, vesicant, or caustic, according to the length of time and mode in which it is applied. Its vapor, when inhaled, acts as a powerful irritant to the mucous membranes of the air passages, and hence its utility in cases of syncope. By using it incautiously, however, in cases of insensibility, fatal results have occurred, the agent acting as an energetic caustic, producing inflammation and ulceration of the mucous membranes of the air passages. The effects in medicinal doses are those of a general stimulant, producing warmth in the stomach, transient vascular excitement, increased heat of the surface, and a disposition to diaphoresis, diuresis, and increased bronchial secretion. In some cases it affects the head, producing a sensation of fullness and oppression, but no pain. Its action upon the nervous system is evinced by the increased capacity to muscular exertion and activity, and the facility with which other functions are performed.

As a remedial agent it is useful in cases where we wish to rouse the action of the heart, without unduly exciting the brain, alleviate spasm and excite the respiratory organs, as in cases of asphyxia and syncope. It is an appropriate remedy in torpor or prostration, and sinking of the vital powers in typhoid or typhus fevers, and other adynamic forms of disease. In the cold stage of intermittents, especially of a congestive form, and in the exanthemata when the eruption has receded from the surface, its diaphoretic and stimulant powers render it an agent of much value. Diluents and warm clothing are required to promote its diaphoretic action.

As an antidote it is employed in cases of poisoning by the narcotics and sedatives, as the fox-glove, tobacco, and hydrocyanic acid; its efficacy depends, probably, upon its highly excitant action.

As an inhalation, the vapor of ammonia is used when a powerful shock to the nervous system is desirable, as in cases of syncope, asphyxia, and to ward off an attack of epilepsy. It is also employed to counteract the influence of anæsthetic agents; in fact, these agents are never employed without having the ammonia at hand, so as to be immediately available in case of accidents.

Antidotes.—In cases of poisoning by Ammonia, the antidotes are diluted acids, of which the best are vinegar, lemon or orange-juice. The consecutive inflammation is to be treated on general principles.

SPIRITUS AMMONIÆ AROMATICUS.

Preparation.—℞ Hydrochlorate of Ammonia ℥vj., Carbonate of Potash ℥x., Cinnamon bruised, Cloves bruised, *aa*, ʒijss; Lemon-peel ℥v., Rectified Spirit, Water, *aa*, Oiv; mix them and let six pints distill.

Dose.—From one-half to one drachm in water.

Aromatic spirit of Ammonia may be exhibited to fulfill the same indications as the simple spirit just named; on account of its more agreeable taste and smell, it is usually preferred to that preparation. It is administered in sick-headache when there is a languid state of the stomach, as a gastric stimulant; and is frequently used for the same purpose in nervous debility, hysteria, flatulent colic, and languid states of the system.

AMMONII CARBONAS.

Dose.—From five to twenty grains properly diluted with water.

Carbonate of Ammonia may be employed to fulfill all the indications of the ammoniacal preparations. It is a stimulant diaphoretic, and for this purpose may be advantageously employed in rheumatism, acute inflammations, and in the continued fevers. It has been employed in epilepsy with reputed advantage, in doses of from ten grains to a scruple. It has been recommended in diabetes, in scrofula, and to relieve venereal pains and nodes, but the evidence is not clear that it gives any more than temporary relief.

ELECTRICITAS.

Electricity is a powerful therapeutic agent, and well deserving a notice under the class of Excitants.

THERAPEUTIC ACTION.—It acts either as a general or local excitant or stimulant, or sedative, according to the mode of application. It excites the vascular and nervous systems, accelerates the pulse, arouses the nervous susceptibilities, stimulates the muscles to involuntary contractions, and promotes the secretions.

Its employment is indicated in atonic states of the system. Paralysis of either the sensor or motor nerves, when unconnected with, or not dependent upon organic lesion of the cerebro-spinal system, are cases requiring the use of electricity. Old cases of paraplegia and hemiplegia, nervous deafness, amaurosis, paralysis of the fore-arm, occasioned by the poison of lead or of mercury, topical numbness, asphyxia, etc., are often entirely relieved or greatly benefited by its application. It should be borne in mind, however, that it can not be expected to afford much, and in general any relief, in those cases of paralysis arising from lesion of the nervous centers; in other words, it is mostly available in paralysis dependent upon functional and not upon organic lesions of the nervous system. It may be remarked that in amaurosis it is rarely of any avail. In amenorrhœa, when, from the concomitant symptoms, it may be supposed to depend upon uterine torpor, the electrical current passed through the pelvis from the sacrum to the pubes, is often followed by the most gratifying results. In loss of muscular power, attendant on chronic rheumatism, and in the stiffness and rigidity following sprains or bruises, it has rendered essential benefit.

In certain convulsive disorders, as chorea, much benefit has often been known to attend its use. Electricity has been employed to promote the absorption of tumors, and serous and synovial cysts, congestions, indurations, dropsical effusions, as in hydrocele, ascites, hydrothorax, hydrops pericardii, hydrops articuli, etc.

In applying electricity to deep-seated parts, as the uterus through the vagina, or the meatus auditorius internus, the conducting wire is made to pass through a glass or rubber tube.

Neligan remarks that the different forms of electricity may be in general indifferently applied, but says that galvanic and magnetic electricity possess the advantages of being more readily employed, of not being interfered with by the state of the atmosphere, of the effects produced being more under control, and in the facility with which they may be applied to different parts of the body; hence they are mostly used at the present day.

It rarely proves speedily beneficial; it is only by its long continued employment that benefit is to be derived. It is also necessary that the intensity of it be not too great, as over excitement from it is especially liable to prove injurious. It should be further remembered, that it is to be resorted to, as a general rule, only as an auxiliary, and not as a principal therapeutic measure.

We now employ the galvanic battery in almost all cases, using the broken or Faradic current, and the constant current. The first is employed for the ordinary purposes of an excitant, and to relieve hyperæsthesia of parts. The second is used for its chemical action, influencing the nutrition of parts or even destroying them if desired.

The single element battery with Ruhmkorff coil and vibrator is the one in common use, and is represented in the market by Kidder, Drescher, Foster, and others. The constant current battery, consisting of a number of elements, is not so commonly used.

If one will take hold of the poles of a battery of this kind, he will find that the current is broken, and is very sensibly felt. One pole will give a distinctly stronger sensation than the other, and this is the positive pole, the current passing into the body; the other negative, the current passing out of the body. The poles are marked on the battery, and if the elements are properly connected with the coil, there will be no trouble.

The first use of the battery is as a direct remedy to the skin and to the cutaneous nerves; the second is to influence a specia organ or part.

This influence may be either sedative or stimulant, and i is essential to know which influence we want, and which w are getting. It has been said that the positive pole is stimulant, and the negative pole sedative, but this will not answer, and is usually wrong. It is the direction of the current as to the direction of the nerves supplying the part that we are to look at. The current passed in a direction contrary to the nervous flow is sedative; the current passed in the direction of the nervous flow is stimulant.

If we are making a general application of electricity to the skin, and want a sedative action, we apply the negative pole to the spine, and pass the positive pole over the surface. If we wish a stimulant action, the positive pole is applied to the spine, and the negative pole is passed over the surface.

This general application is one of the best uses of electricity, not only influencing excretion directly, but exerting a most favorable influence upon the innervation of the patient. Of course it is understood that the poles are embedded in a wetted sponge.

In making a local use of electricity, we must know whether a stimulant or sedative influence is required. Has the part an increased circulation? is its condition one of irritation? If so, we use the sedative current--the positive pole applied over the part, the negative pole to the spine where its nerves are given off. Are the sensations those of atony or congestion—fullness, weight, dragging?—then we want the stimulant current—the negative pole applied over the part, the positive to the spine where the nerves are given off.

ELECTRO-PUNCTURE.

Electro-puncture, or Galvano-puncture, is the introduction of acupuncture needles in the usual manner: connecting one or more of them with the poles of a voltaic battery, a succession of shocks may be given by the frequent suspension and restoration of the connection; or they may be made to form a part of the circle in the passage of the electric current.

This practice has been adopted in many instances with great success, in rheumatism, neuralgia, local paralysis, sciatica, spasmodic affections, etc. Electro-puncture has been employed in cases of asphyxia, and it has been proposed to pass the needles on each side between the eighth and ninth ribs into the diaphragm, and establish an electric current; and M Bourgeois went so far as to propose the electro-puncture of the heart in order to accomplish resuscitation in asphyxia. Electro-puncture acts powerfully as a special or local excitant, and also revellent.

Its local derivation and excitant action point to it as a remedy of primary importance in chronic rheumatism, neuralgia, paralysis from torpor of the nerves, morbus coxarius, sciatica, and affections of the spinal cord.

CALORIC.

HOT-AIR BATH.—The hot-air bath consists in the application of air to the surface of the body, heated to the temperature of from 98°—the temperature of the body—to 120° or 130°. It is a powerful excitant.

HOT-VAPOR BATH.—This consists in the use of the vapor of hot water, or the *medicated vapor*, various medicinal substances being added to the water, or in the application of the vapor of burning alcohol or some kind of ardent spirits heated to 120° or 140°. The vapor bath is excitant, revellant, and sudorific. It softens and relaxes the skin, increases the fullness of the capillaries of the surface, accelerates the pulse, and causes sweating. It is more soothing and relaxing, and consequently better calculated to induce diaphoresis than the hot-air bath. It is also employed in congestive forms of disease, as in the cold stage of agues, and in cholera, also when sweating is desirable, as in rheumatism, gout, local swellings and inflammations, chronic cutaneous affections, chlorosis, amenorrhœa, dropsy occurring in old and debilitated subjects, old liver affections, scrofula, etc.; in many of which it is an agent of immense utility. The vapor of burning spirit is a much more powerful means in accomplishing the results which follow from the vapor of hot water. It is powerfully excitant, sudorific, revulsive, and relaxing; valuable in the early stages of many febrile and inflammatory affections.

HOT-WATER Bath.—This bath has a temperature of from 98° to 102°. It is strongly excitant to the nervous and vascular systems. It renders the pulse fuller and stronger, and causes redness of the skin, with distension of the cerebral vessels and violent throbbing, and, if long continued, may cause apoplexy. It is employed in rheumatism, paralysis, and neuralgia. Hot bricks, bottles of hot water, hot flannels, hot sand, hot salt, etc., all exert an excitant influence upon the system. (See Baths, etc., in another part of this work.)

Dry and hot vapor is more stimulating and exciting to the capillaries of the surface and to the general system, than the vapor of heated water or the medicated vapor, and less debilitating to the system, and is therefore better adapted to patients greatly prostrated by disease.

Hot air is an excellent excitant and revulsive application in the congestive forms of disease, as in congestive intermittents and remittents, Asiatic cholera, asphyxia from drowning, chronic rheumatism, neuralgic affections, etc. It is sometimes impregnated with sulphurous acid gas or chlorine, and used in chronic cutaneous diseases.

NUX VOMICA.

THE SEEDS OF STRYCHNOS NUX VOMICA.—EAST INDIES.

PREPARATIONS.—Tincture of Nux Vomica. Strychnia.

DOSE.—The dose of the tincture will vary from the fraction of a drop to five drops. For its specific use we add from one to five drops to four ounces of water, and give in teaspoonful doses every half hour or hour. The dose of strychnia will range from one-hundredth to one-twentieth of a grain, according to the effect desired.

SPECIFIC INDICATIONS.—The patient has pain in the abdomen which shifts its position; pain pointing to the umbilicus; hypogastric pain resembling colic; nausea and vomiting, the tongue being pallid; yellowness about the mouth, sallowness of skin; pain in right shoulder and region of the liver; difficulty in breathing, especially when the patient sleeps; inability to command the voluntary muscles; want of power in the bladder to void urine.

THERAPEUTIC ACTION.—In small doses it is stimulant, tonic, diuretic, diaphoretic, laxative, anthelmintic. In large doses it is tetanic or cerebro-spinant, poisonous.

In small and repeated doses Nux Vomica promotes the appetite, aids digestion, renders the secretion of urine more copious and its excretion more frequent, acts as a laxative and diaphoretic.

In larger doses it causes weakness and a weighty sensation in the limbs—sensibility to surrounding impressions is increased, as the sensation to touch, change of temperature, sound, light, etc. There is depression of spirits and anxiety, tremors, rigidity or stiffness of muscles, with inability to maintain the erect posture; he staggers as he walks, and if the medicine be continued the intensity of its action becomes increased; the voluntary muscles are easily thrown into a spasmodic state, so that by a deep inspiration, or any effort or exertion, a convulsive paroxysm ensues.

In poisonous doses it causes tetanus, asphyxia and death. Slight and transient convulsions appear at first, with great thirst; finally the convulsions become more frequent and severe, every muscle is fixed and rigid, the face and hands become livid, the spasm is short, and during the intervals the patient is sensible; no pain is experienced, the pulse and respiration are suspended, and a fatal asphyxia ensues.

We employ Nux for the relief of nausea and vomiting depending upon gastric atony and enfeebled spinal innervation. The indication is clear: the tongue is pallid and expressionless—atonic; the lower part of the face gives the same evidence—yellowness or sallowness about the mouth and feeble expression. The dose should be small—just enough to render the water bitter is sufficient.

We employ it in the treatment of colic, both in infants and adults. In infantile colic, whether gastric or intestinal, it stands first in the list of remedies. One drop in a third of a glass of water, given in small doses frequently repeated, gives speedy relief. In the adult we do not want to mistake an inflammatory condition for a purely nervous disturbance, or the colic from hyperæsthesia of the intestines for that which is associated with atony. Nux being a stimulant is especially adapted to the atonic cases, in which it gives prompt relief. Five or ten drops are added to a half glass of water, and given in teaspoonful doses frequently repeated.

In "uterine colic" it is an admirable remedy. The pain is violent, and simulates colic, and there is evidence of an atonic condition, both general and local. It is also a remedy in dysmenorrhœa with symptoms as above; in this case it is usually given with Macrotys.

We employ Nux and Strychnia in the treatment of atonic diarrhœa, associating it with Ipecac, Euphorbia hyper. or Bismuth. It is an admirable remedy in cholera morbus, and finds a place in the treatment of Asiatic cholera. In these cases, if it can not be taken by mouth, on account of the irritability of the stomach, we use it by hypodermic injection. If the circulation is feeble, the injection should be thrown in over the sternum.

Nux is an admirable remedy in the treatment of cholera infantum, being especially adapted to those cases characterized by atony. It relieves nausea and vomiting, strengthens the stomach, improves digestion, gives better innervation, and, with Ipecac or Euphorbia, checks the bowels.

We employ Strychnia as an antiperiodic in the treatment of ague when there is marked atony of the stomach and feeble spinal innervation. The specific indications given at the commencement of this article will point the way to its successful use. The antiperiodic quantity will be about one-fifth of a grain in divided doses. If the remedy can not be given by mouth, it may be used by hypodermic injection.

In the cold stage of congestive intermittents, as well as in cholera, the hypodermic injection of Strychnia is one of our most powerful means. In some cases the patient is in such condition that no remedy will be absorbed from the stomach, but so long as there is a chance for life, it will be absorbed from the cellular tissue of the chest.

It should not be forgotten that Nux is a good remedy in some cases of habitual constipation. One drop in a glass of cold water in the morning on rising, will frequently overcome this unpleasant condition.

Its utility in paralysis appears to depend upon an increased or preternatural irritation or excitement in that portion of the spinal cord from which the nerves emanate that supply the paralyzed muscles, and from which the nervous influence is derived.

Its capacity to increase the susceptibility to external impressions, has secured its exhibition in the treatment of paralysis depending upon functional lesion of the sentient nerves, as well as in that affecting the motor nerves. Its exhibition in paralysis of the sentient nerves has not been attended with the same happy results as in that of the motor nerves.

It has been successfully employed in impotency. The excitement which the Nux Vomica has been known to occasion in the sexual organs induced Trousseau to employ it in that affection, when he found it successful in both males and females.

IGNATIA.

THE SEEDS OF STRYCHNOS IGNATIA.—EAST INDIES.

PREPARATIONS.—Tincture of Ignatia.

DOSE.—To water ℥iv. add gtt. v. to gtt. xx., and give in teaspoonful doses.

SPECIFIC INDICATIONS.—Pain in hypogastrium and pelvis; ovarian irritation; pain with weakness in small of the back; pain along the course of the crural nerves.

THERAPEUTIC ACTION.—The action of Ignatia is very similar to that of Nux Vomica. Our homœopathic neighbors say, give Nux to men, Ignatia to women, and in this I think they are right, though there are many diseases of men in which the latter acts well.

I employ it principally as a stimulant to the pelvic organs, and the reproductive function. The condition indicating it is one of atony. The uterus is enlarged, the ovaries enlarged and tender, and there is a sense of uneasiness with weight and dragging, associated with sharp expulsive pains. It relieves pain, and gives a better innervation, both spinal and sympathetic.

Ignatia is a good remedy in some cases of dysmenorrhœa, associated with Rhus, or with Macrotys or Caulophyllum; and influencing the menses, promoting a normal and less painful flow, it becomes a remedy for sterility.

The reader, by following the specific indications as given, will be able to make this a very serviceable remedy in other cases than those I have mentioned.

STRYCHNOS TIEUTE.

This is another species of the Strychnos, the aqueous cortical extract of which affords the poison called the *Upas Tieute.* The Upas Tieute consists of Strychnia combined with Igasuric Acid and coloring matter. Its effects are the same as the Nux Vomica.

STRYCHNOS TOXIFERA.

This is another species of the Strychnos, and the one which yields the basis of the celebrated poison of Guyana, known as *Woorari, Ourari,* or *Urari,* which is said to "produce paralysis with convulsive movements, and death from apparently suspended respiration."—*Pereira.*

There are sundry other species of the Strychnos named by systematic writers, most of which are poisonous, but as none of these are used for medicinal purposes, it is unnecessary to devote more space to their consideration.

STAPHYSAGRIA.

THE SEEDS OF DELPHINIUM STAPHYSAGRIA.

PREPARATION.—Tincture of Staphysagria.

DOSE.—To ℥iv. of water add gtt. x. to gtt. xx.; dose, one teaspoonful.

SPECIFIC INDICATIONS.—Sense of fullness in the perineum and along the urethra; mucoid discharge from the urethra; sense of fullness about the anus, and mucoid discharges following stool; enlarged prostate, prostatorrhœa, spermatorrhœa.

THERAPEUTIC ACTION.—Staphysagria exerts its influence upon the lower pelvic organs. It may be used in chronic cystitis with mucous discharge, chronic urethritis, the second stage of gonorrhœa, chronic vaginitis, leucorrhœa, chronic inflammation of the prostate, and chronic inflammation of the lower portion of the rectum. In these diseases the indications given above will be a good guide.

It exerts a marked influence upon the prostate gland, the vesiculæ seminales, and the testes, relieving irritation. I have employed it for years to cure prostatorrhœa, arresting the discharge which has so excited and alarmed the sufferers. It also exerts a good influence in spermatorrhœa, relieving the mind by checking the prostatic and urethral discharge, and diminishing the tendency to nocturnal emissions.

ERYTHROXYLON COCA.

THE LEAVES OF ERYTHROXYLON COCA.—SOUTH AMERICA.

PREPARATION.—Tincture of Coca.

DOSE.—From five drops to half a drachm.

THERAPEUTIC ACTION.—In Columbia the natives use it to enable them to endure prolonged exertion without taking food. It seems to serve a similar purpose to coffee and tea, though it is claimed that it lessens the waste of tissue, enabling the person to endure great fatigue.

For some time I have been using this remedy in a class of cases where there was defective innervation, some dyspepsia (imperfect digestion, though the appetite was good), pain in the occiput and neck, with dizziness and inability to stand for any length of time.

In three of these cases where the most marked benefit was experienced, the disease had been diagnosed "dumb ague," and treated with quinine to the extent of lessening (stopping in one case) the afternoon feverishness, but leaving the unpleasant symptoms named above.

In one case the patient had been a sufferer from rheumatism for a year or more, had ovarian irritation with scanty menstruation, functional heart disease, and inability to digest the ordinary food used by the family. Anti-rheumatics had removed the pains, the heart-beat had come down from 110 to 70, and the irregularity of pulse had disappeared. She had gained flesh, but had no strength, and was nervous and despondent. The food was changed to a very plain diet in moderation, and the Coca given in fifteen drop doses every four hours, with the most marked benefit.

A business man had suffered from overwork, some worry, good living, and want of exercise, and now finds himself with some dyspeptic symptoms, pain in the occiput, and dizziness. A spare diet was recommended, all stimulants to be avoided, open-air exercise to be taken, and ten drops of Coca every three hours. He improved steadily, and was himself again in the course of a month. Was it the Coca, or was it the diet, avoidance of stimulants, and the open-air exercise? The reader may answer these questions for himself. I think both had something to do with the cure, but I am sure that without the diet and exercise he could not have recovered. I do not think it well to make a hobby of Erythroxylon Coca, or of any other remedy, but it may be remembered as a very good nerve stimulant in the cases I have named.

ARTEMESIA.

THE "WILD SAGE" OF THE WESTERN PLAINS.

PREPARATION.—It is used in infusion, a tincture is prepared, and it yields an oil by distillation.

THERAPEUTIC ACTION.—A correspondent in the West writes: "The herb is used as a fomentation by our best physicians. By the people in infusion for fever, rheumatism, diphtheria, and putrid sore throat. The oil is used as a liniment, mixed with olive oil, in deep-seated erysipelas, with the best results. Bruises, sprains, and swellings, are treated in the following manner: the part being bathed with the oil, the hot herbs are bound on the part and covered with oiled silk to prevent evaporation. The results are most gratifying."

CLASS VIII.

ANÆSTHETICS.

By the term anæsthetic we understand an agent capable of occasioning a suspension of general sensation. In other words, this class of remedial agents are resorted to, to induce a state of temporary insensibility. Their use may be carried to the extent of causing but partial anæsthesia, but they are chiefly exhibited, however, until a state of entire insensibility is attained. This class of agents may be divided into two kinds; the first, acting upon the entire system, producing a like insensibility of all parts, may be termed *general* anæsthetics; while the second affecting but the parts to which it is applied may be called *local* anæsthetics.

To induce a state of insensibility in cases of excessive pain, especially in painful surgical operations, has been an important desideratum with the profession, eagerly desired for centuries past, and various means have been adopted, at different periods, to secure the desired object.

It is asserted that the Chinese were not unacquainted with anæsthetic agents as early as the third century. A Chinese book, in the National Library of Paris, states that when about to perform painful operations, a Chinese physician, by the name of Ho-a-tho, gave his patients a preparation of hemp, which soon rendered them insensible to the operation, however painful. The Greeks and Romans are said to have used anæsthetic agents. M. Velpeau states, that "The so-called Memphis-stone, dissolved in vinegar, after having been reduced to powder, was used as an anæsthetic agent among the Greeks and Romans; and mandragora was extensively known as possessing anæsthetic properties." Again the same author states that Hugh of Lucca, an eminent physician of the thirteenth century, employed anæsthetics. "A sponge dipped in the juice of nightshade, hyoscyamus, cicuta, lactuca, mandragora or opium, was put under the nose of patients, and made them sleep during operations." The Turks, it is said, have for a long time induced anæsthesia on subjects who were going to submit to circumcision. Sir Humphrey Davy used the nitrous oxyde gas to relieve tooth ache, and suggested its use in surgical operations. Mr Wells, of Hartford, employed this gas in 1842, for extracting teeth without pain; and others employed this, or some other agent, some 30 years ago, to relieve pain.

From the foregoing remarks it seems various agents have, at different periods of time, for many centuries past, been exhibited with a view to the induction of anæsthesia in painful operations and pain dependent upon other causes. Notwithstanding the use of these agents at different periods by certain physicians, they did not meet with general favor by the profession, for the reason, perhaps, that they were not regarded as reliable, or their use was not unattended with danger. The advantages and comparative safety of the agents now in use as anæsthetics, have but recently been discovered and fully tested. Those formerly used seem not to have been generally known—at least but few used them—and no agents of a reliable character in all respects have been known to the profession generally until within quite a recent period.

The meed of praise for the discovery and introduction into general use of an agent that would render painful operations painless, was reserved for our countryman, Dr. Morton, of Boston, who made known the results of his experiments with sulphuric ether as an anæsthetic, in 1846. Through the influence of Dr. Morton, and after repeated cautious experiments, Dr. J. C. Warren was induced to employ it in an operation performed at the Massachusetts General Hospital on the 15th of Oct., 1846. Anæsthesia was but partial in this case. On the succeeding day, Professor Hayward operated, having first induced a state of complete insensibility of the subject upon whom the operation was to be performed. From this beginning the anæsthetic power of ether, in the form of inhalations, spread with great rapidity throughout the civilized world, and is now regarded as one of the most important discoveries of the present century.

About one year after the anæsthetic powers of ether had been established, Professor Simpson, of Edinburgh, after repeated experiments, announced that *chloroform* was a still more effective remedy for producing anæsthesia. This new agent soon acquired a reputation equal and even surpassing ether. Its advantages were its more rapid and intense action, its smaller dose, and its more agreeable taste and smell. In addition to sulphuric ether and chloroform, other general anæsthetic agents have been discovered and experimented with; yet none have been found to possess their advantages. Among these we might name the *chloride of hydrocarbon*, *nitrate of ethyle*, *benzin or benzole*, *aldehyde*, *bisulphuret of carbon* and *amelyne*.

Importance of Anæsthetics.—As to the importance of anæsthetics as therapeutic agents, it appears to us no division of opinion can obtain. That the severity of the sufferings in many painful operations depresses the vital powers, exhausts the nervous energies, or communicates such a shock to the nervous system, and inflicts such an injury on many constitutions as to destroy life almost immediately, and in others to jeopardize the recovery of the patient, are truths which none are disposed to dispute. The induction of anæsthesia most effectually counteracts such results. Again, the powerful shock, the great depression, the exhausting and insupportable effects which the dread of pain, or the fear of an operation exerts upon the nervous and timid, serve, in many instances, to overwhelm the patient and sink his vital powers beyond the possibility of reaction; hence the prospects of a favorable termination are materially lessened, or, perhaps, entirely destroyed. Nothing more effectually destroys the recuperative powers, or the early reactive energies of the system, than fear; fear as to the final result, or dread of pain, overpowers or almost destroys life in many instances, even before the operation is commenced. Again, an operation is performed much more deliberately, and with much less perturbation by the surgeon, when the patient is not writhing in agony—when he is known to be enjoying entire immunity from pain, even though the operation be one of great severity. All the circumstances here alluded to, and many more, tend to increase the immediate danger, and lessen the prospects of a speedy convalescence—results which are counteracted by the induction of anæsthesia.

Does anæsthesia diminish the mortality following severe operations? This is a very important question, and if decided in the affirmative, adds much weight to the reasons already advanced in favor of its employment. That this is the case, we believe is not disputed at the present day. Mr. Curling says: "I have carefully watched the progress of cases, after operations of various kinds performed upon persons in a state of anæsthesia, and I can, with confidence declare that, so far as my present experience has reached, the constitutional symptoms have been milder, and the cases have proceeded more satisfactorily, than after operations in which no means had been taken to prevent pain. Several of my surgical friends can fully confirm this statement." Prof. Syme says: "As to the cases in which chloroform should be employed, it may be said that there are hardly any in which pain would otherwise be inflicted, where its use is not desirable for the patient, and incumbent upon the practitioner to propose. At an early period of our information on this subject, it was thought that in a state of collapse, or extreme depression from weakness, fatal sinking would be apt to result from the effect of chloroform. But so far from this being the case, it has been found that the most serious operations may be performed under the influence of this agent, in circumstances of the most extreme exhaustion, with results infinitely more successful than could have been anticipated otherwise." These authorities might be multiplied, but we wish next to see, from statistics, to what extent the mortality is diminished. The following table of the mortality of amputation of the thigh, with or without etherization, collected by Dr. Simpson, will illustrate this point:

Names of Reporters.	No. of Cases.	No. of Deaths.	Percentage of Deaths.
Parisian Hospitals—Malgaine,	201	126	62 in 100
Edinburgh Hospital—Peacock,	43	21	49 in 100
General Collection—Phillips,	987	435	44 in 100
Glasgow Hospital—Laurie,	127	46	36 in 100
British Hospitals—Simpson,	284	107	38 in 100
Upon patients in an etherized state,	145	37	25 in 100

"The preceding figures" says Dr. Simpson, "speak a language much more emphatic than any mere words that I could employ in favor of anæsthesia, not only as a means of preserving surgical patients from pain, but as a means also of preserving them from death. Between even the lowest mortality in the table without anæsthesia, 36 in 100, and the rate of mortality with it, 25 in 100, there is the difference of eleven per cent. That is to say, according to this standard, out of every 100 patients submitted to amputation of the thigh without anæsthesia, eleven more would die from the operation than if the same 100 patients were submitted to the same operation in a state of anæsthesia."

The same arguments may be adduced in favor of anæsthesia in parturition. Although they check the pains for a short time, yet they promptly return and are often more efficient and the labor progresses with greater rapidity than when they are not employed. In painful and difficult labors, in cases of rigidity of the os uteri, or of the perineum, vaginal muscles, and surrounding soft parts, in cases of turning, use of forceps, and other operations, in spasms or convulsions, adherent or retained placenta, hour-glass contractions, etc., anæsthetics merit our special attention.

While in a state of anæsthesia the patient enjoys entire freedom from the sufferings which in many cases are extreme, and the shock that would otherwise be inflicted upon the nervous system. Not only so, but the freedom from pain, and loss of consciousness renders the patient passive, when otherwise her restlessness might prove injurious, rigidity of the soft parts is removed, the vaginal secretion increased, and yet the contractions of the uterus are said to retain all their expulsive force. It must be evident that the dread of pain or fear of suffering, must cause a voluntary if not involuntary resistance on the part of the patient to the progress of labor, and to the operations incidental to obstetrical practice. Is it not then apparent that when the system is in a perfectly passive state, when entire relaxation exists, all resistance of a voluntary character being withdrawn, and all spasm or rigidity of the muscular fiber calculated to retard the advancement of labor being overcome, while the uterine contractions remain in full force, labor must be greatly expedited, and that at far less expense to the physical and nervous energies of the system. The facts in the case bear out the arguments adduced above in favor of the use of anæsthesia, if the statistics of European hospitals as well as private practice are reliable data upon which to base a conclusion. Labors have been more rapid, the system less exhausted recoveries more speedy, while the occurrence of rigors, ephemeral fevers, abdominal pains, convulsions, puerperal inflammation and fever, and many other serious diseases incidental to the puerperal state, is greatly reduced by the employment of anæsthesia.

Anæsthetics have been employed with unequivocal advantage in *puerperal convulsions*. The violence of the spasm yields promptly to their influence, and is often immediately arrested. If other measures fail, their importance in these cases should never be overlooked.

They have been used in both *idiopathic and traumatic tetanus*, more especially in the former variety, with much success. Their influence should be maintained for a considerable length of time, in order to secure the advantages to be derived from their exhibition. They have also afforded temporary relief in cases of *hydrophobia*, although not a prolongation of life.

Spasmodic asthma is another affection in which entire and immediate relief of the paroxysm has followed their exhibition. The relief they afford in these cases, is but temporary, it is true, nevertheless it is a respite devoutly desired by the patient.

In *delirium tremens* their effects are said to be very satisfactory. The induction of anæsthesia is often somewhat difficult to be attained in this affection—more especially if ether be the anæsthetic used; but so soon as quietude ensues an artificial sleep follows, which is soon succeeded by a natural sleep, more or less protracted. When the patient awakes to a state of consciousness, he is calm and perfectly composed If the patient is weak, and the system already exhausted by continued debauchery, the induction of anæsthesia should be gradual.

Anæsthetics have been used with great success in cases of *neuralgia*. Their exhibition in this disease is seldom unattended with temporary relief of pain; and should the pain return, a repetition of the anæsthetic again removes it, and by two or three repetitions it has, in many instances, been entirely subdued.

In other painful affections, as toothache, rheumatism, sciatica, colic, spasm of the stomach or bowels, etc., their use is salutary and desirable; even in the more painful and spasmodic forms of *Asiatic cholera*, we have no doubt but partial anæsthesia would afford much relief; but it should not be allowed to interfere with other medication for the radical cure of the disease. If used at all in this case, it should be only with a view to the relief of the extreme sufferings of the patient.

Action of Anæsthetics.—General anæsthetics no doubt act directly upon the cerebro-spinal centers. The inhaled vapors are first absorbed into the blood, as is proved by the detection of them in different parts of the body,—even in amputated limbs,—and in their exhalation by the breath for a considerable length of time after the cessation of the inhalation. Their first effects are loss of mind and volition, then follow loss of sensation and motion, and lastly the power of respiration.

Anæsthetics first cause excitement, attended with ringing in the ears, restlessness, confusion of intellect, and partial insensibility. In some cases, great excitement, accompanied with screaming and violent efforts are among the first manifestations of its action on the system. Very soon a sleep, more or less profound, follows, consciousness is lost, the muscles are rigid, and the sensibility blunted. Soon, however, a state of general relaxation follows, with a profound sleep, and an entire loss of sensibility; respiration in this stage becomes stertorous, though regular; the pulse is also regular. Finally, the respiration becomes irregular, or interrupted, and the pulse weak and fluttering, and if permitted to continue in this state for but a few seconds, respiration would cease and death ensue. The order here stated is not always observed, for the effects are irregular in many cases. In some instances no period of excitement is observable, the patient at once sinking into a state of profound narcotism. In others, the sensibility is lost, while consciousness remains unimpaired.

Although this is denied, yet cases of parturition, as well as painful operations are reported, in which consciousness remained unimpaired, perception clear, yet sensibility was greatly diminished, or entirely destroyed. In other cases, ensibility remains, as is evinced by the screams and evident suffering—the patient, however, being unconscious, and having no recollection either of suffering, or of any thing that occurred during the operation.

Dr. Snow divides the action of anæsthetics into five stages, or degrees; and though it will be almost a repetition of what we have already stated, yet as our object is to present the subject in the plainest form, we will quote his remarks.

"In the *first* there exists a kind of inebriation, which is usually agreeable when induced for curiosity, but is often otherwise, when the patient is to undergo an operation. Consciousness to surrounding objects remains unimpaired, though the power of vision seems slightly affected, and sensation is so much blunted that the pain of disease, which is generally due to a morbid increase of the common sensibility, is in many cases removed or relieved, according to its intensity.

"In the *second* degree, the mental functions are impaired, but not entirely suspended; consciousness, however, no longer continues correct, and a sort of dreamy state supervenes. This degree may be considered analogous to delirium, and to certain states of the patient in hysteria and concussion of the brain; and it corresponds with that condition of an inebriated person, who is *not dead drunk*, but in that state described by the law as *drunk and incapable*. It is very transitory, and if the inhalation be suspended, the patient in a very few minutes recovers the perfect possession of the mind. A considerable degree of anæsthesia is induced, even in this stage; and sometimes a high amount of mental excitement, that renders the patient difficult to manage, shows itself.

"In the *third* degree, all voluntary motion is paralyzed; and often a rigid, spasmodic contraction of the muscles of the extremities occurs. The mental faculties are completely in abeyance, the eyes are most frequently drawn forcibly upward, and the vessels of the conjunctiva sometimes become injected with red blood. It does not follow, however, that an operation may always be commenced immediately the narcotism reaches this degree, for anæsthesia is not a necessary part of it.

"The *fourth* degree brings with it relaxation of the voluntary muscles, together with complete insensibility to external impressions, so that no pain is felt even on the infliction of severe personal injuries. Yet, although reflex movements can not be excited by touching even the most sensitive parts of the frame, still some functions of the spinal cord remain, as the sphincters continue contracted, and according to most of its advocates, the action of the uterus in labor is not materially interfered with. The breathing is not unfrequently attended with some degree of stertor.

"The *fifth* degree of narcotism, is *the commencement of dying*. The breathing first becomes irregular, slow, and difficult; then soon ceases altogether—while the heart continues to beat for a short time, even after the last breath is drawn."

Mode of Administration.—General anæsthetics are all of them administered in the form of vapor. All the anæsthetic agents yet discovered are very volatile, the vapor being inhaled and absorbed into the blood, through the capillaries of the lungs, is conveyed by it to all parts of the system, specially affecting the brain and spinal cord. Many forms of apparatus have been invented for exhibiting these agents, but like many other things in medicine and surgery, the simplest means has proved the best. The mode in which ether and chloroform are now principally administered in this country, is to take a handkerchief or napkin, folding it three or four double, and pouring on the center of it about a drachm of the anæsthetic. This is applied to the nose, yet not so close as to prevent the inhalation of a sufficient quantity of air with the vapor: it is brought gradually closer to the face as the patient comes under the influence of the agent. M. Chassaignac recommends a sponge, about as large as a man's fist, wetted with the anæsthetic, and tied up in the corner of a napkin. "The napkin, which contains the sponge in its knotted corner, covers up the patient's eyes, so as to hasten and facilitate the anæsthetic stupor. It prevents also too large a proportion of air mingling with the vapor of chloroform." He also recommends that the patient be always placed in a recumbent position. This though the best position, is not indispensable, for we have seen many cases in which it was administered in a sitting posture, with perfect safety.

The question now arises, *To what degree should anæsthesia be carried in order to obtain its beneficial effects, and yet incur the least danger of a fatal result?* In reference to this question there has been much difference of opinion, some maintaining that the second and third degrees are sufficient, illustrating their views by keeping their patients in a half-sleeping, half-waking state, requiring the almost continued administration of small portions of the anæsthetic; while others contend that the *fourth* degree, or *stage of toleration*, should be secured in all cases before commencing an operation.

M. Chassaignac thus describes the symptoms to be noticed, and the stage of tolerance in the exhibition of chloroform, which he believes is the proper degree of anæsthesia to be obtained. After describing the first few inhalations, he says: "I then concentrate my whole attention on the symptoms which reveal the degree of anæsthetic action; the following are the sources of information to which I apply:

"*a.* The state of the pulse.

"*b.* The state of the respiration, appreciated by inspecting the epigastric region, which expresses in a far more significant manner the state of that function than the costal walls of the thorax.

"*c.* The patient's face, which, by its sinister expression, often indicates the approach of danger, long before the respiration and pulse have caused any serious apprehension.

"*d.* I attend with particular care to the last manifestations of the period of agitation, and the first appearance of the stage of collapse. At this moment I immediately remove the sponge, and wait for the stage of 'tolerance.' Lastly, when this stage is fully established, on the slightest manifestation of returning sensibility, I give the patient small quantities of chloroform by means of the above-mentioned apparatus.

"This, then, is the manner in which I proceed, and these are the means by which I seek to obtain, before operating, what I call 'anæsthetic tolerance.' The inhalation is commenced with all due caution, and when the period of agitation arises, I allow it to pass off without suspending the inhalation, until the patient arrives at the state of collapse. As soon as this is manifested, I suspend completely the inhalation. I wait until the respiration and pulse become regular, and until the patient is plunged into that peaceable sleep which in many persons succeeds to the first stages of anæsthesia. This sleep—with perfect regularity of the great functions, with decrease in the number of pulsations, with complete equilibrium of the respiration, which is deep and calm—constitutes for me the state of anæsthetic tolerance.

"I can affirm, from having experimented a great number of times, that when the patient has arrived at this state he is subject to no kind of danger, whatever may be the time during which it is prolonged. It is to be remarked, that in this state the general insensibility and muscular resolution are present almost in the same degree as in the period of collapse. But when the 'tolerance' exists, sensibility will revive, if we do not take, in this respect, particular precautions. And it has been observed that, in patients arrived at this state of almost saturation, very small quantities of chloroform, in doses incapable of bringing on any accident, suffice to sustain the anæsthesia, without disturbing in any way the state of 'tolerance' in which the economy is plunged. We have, then, every kind of security that we can wish for; first, against pain, complete insensibility; secondly, against dangerous functional disturbance, perfect regularity of the functions. And besides, the surgeon, exempt from all anxiety on the score of the anæsthesia, can give himself up entirely to the operative department.

"This state of 'anæsthetic tolerance,' unfortunately, is not always as easy to obtain as one might believe; there are subjects whose constitution is, in some manner, opposed to it. It would seem that we can only obtain from them excitement or collapse, and that the medium state, which constitutes essentially 'tolerance,' can not be produced. They commence, as do nearly all subjects, by excitement, and arrive at collapse; but as soon as this is about to finish, it gives place to new excitement. It is only in children, in certain women, or in adults very debilitated, that we pass from the period of excitement to that of 'tolerance,' without observing the state of collapse."

It has already been stated that the fourth degree of anæsthesia, according to Dr. Snow, is the stage termed by M. Chassaignac that of "toleration"; but this is not exactly the case, it being a medium between that and the third degree. Thus, when we exhibit chloroform, we find that when we reach the fourth stage,—*relaxation of all the voluntary muscles, and complete insensibility*, or as it is termed by M. Chassaignac, "*the stage of collapse*,"—there is more or less irregularity of the respiration and circulation. As soon as this subsides, we have the state of "tolerance" described.

Contra-Indications.—Some states of the system are less favorable to the use of these agents and the induction of anæsthesia than others. Organic diseases of the heart and large vessels, as hypertrophy of the heart, ossification of its valves or of the large arteries, aneurisms, etc., contraïndicate their use, or at least lessen the probability of a successful termination. These conditions do not, however, absolutely forbid their use; but in such cases they should not be employed without they are imperatively demanded, and should then be used with the greatest care and caution. In cases of great plethora, anæsthesia is effected with greater difficulty, and with less regularity. To obviate this, a hydragogue cathartic should be prescribed, and abstinence enjoined previous to the use of the anæsthetic, unless the delay will augment the danger.

In order to insure success, quietude or a state of perfect tranquillity should be enjoined and obtained, if possible; not that it is impossible that a state of anæsthesia may be secured without the observance of these rules. Talking to the patient, or loud talking in the room, should always be prohibited, as it always increases the difficulty of bringing the patient under the influence of the anæsthetic.

Food should not be taken a short time previous to the exhibition of the anæsthetic; in other words, the last meal should have time to digest before its administration. The reason for this is, that otherwise the anæsthetic would be very apt to produce vomiting as its effects were passing off, or even during an operation, providing the agent happened to be suspended, and the patient commenced to recover from its effects.

A free supply of atmospheric air is absolutely required in conjunction with the anæsthetic at all times; for without it life is endangered. The failure to observe this precaution has undoubtedly given rise to most of the fatal results arising from the use of chloroform.

It is an imperative rule that the one who administers the anæsthetic should watch the pulse, the respiration, and the general state of the patient, closely, from the first inspiration until sensibility and consciousness are completely restored. "Not one beat (says a writer) should the heart give that the finger does not take note of." We think, however, that the signs furnished by the respiration are of more importance. As soon as the pulse begins to sink or flutter, the anæsthetic should be removed, and fresh air admitted. If the respiration becomes stertorous, the inhalation should be discontinued; and should it be irregular and interrupted, the danger is great, and active measures to restore the patient should be adopted. Among these we might mention blowing in the face, dashing cold water in the face, the application of strong nasal stimulants, as the ammonia, etc. The importance of this last is so great, that surgeons who make much use of these agents invariably have the ammonia in the room. Should these measures fail, *artificial respiration*, or the *ready method* of Marshall Hall, is not to be neglected; it is, indeed, the sheet-anchor of our hopes, or, as a certain writer remarks, the alpha and omega in this emergency; and if long withheld death must be inevitable.

Local Anæsthetics.—On this division of anæsthetic remedies we will not have much to say, for as yet they have proved only partially successful. While general anæsthetics act upon the nervous centers, in great part stopping innervation, and producing complete insensibility of all parts of the body, these act directly upon the nerves of the part, so changing their condition that they no longer transmit impressions.

If perfect local anæsthesia could be attained, there is no doubt but what it would prove preferable in many cases to its general induction, as it must be admitted that there is more or less danger in the administration of the latter class of agents. Still, we as yet see no prospect of a much greater success than has already been obtained.

The first mode of producing local anæsthesia, that is well authenticated, was proposed by Dr. Moore, in 1784. It consisted in compressing, by torniquets and pads, the nervous trunks going to the limb to be operated upon. It was tried with partial success by John Hunter, in a case of amputation of the leg. It is stated that in this case, "at the circular incision through the skin, the patient did not cry out, change a muscle of his face, or show any symptoms of pain. At the subsequent parts of the operation, particularly during the sawing of the bones, he showed marks of uneasiness in his countenance, but did not cry out." Dr. James Arnott proposed to employ a freezing mixture, to induce local anæsthesia. His mode of applying it consisted in filling a bladder partly full of tepid water, placing it upon the part so as to cover the portion of skin to be rendered insensible; then gradually dropping in ice, and lastly salt, so as to bring the temperature gradually below the freezing point. This method has proven successful in operations upon the skin and superficial parts, but can never be employed as a substitute for general anæsthetics in the major operations. We have employed it with success in removing a small subcutaneous tumor, in removing inverted toe-nail, and to remove the sensibility when lancing felons, abscesses, etc.

Experiments have been made with the vapor of chloroform and other agents, applied locally; but they have not proved successful. It has been proved, however, that they are capable of relieving the pain attendant upon many morbid states, both of the skin and mucous membrane. Thus the vapor of chloroform, directed upon the part in a jet, will remove the pain of irritable ulcers, and when injected into the vagina, will remove many painful and neuralgic conditions of the uterine and adjacent organs. For this latter purpose, however, it is not equal to carbonic acid gas, which we have found eminently useful in relieving dysmenorrhea, irritation of the uterus, bladder, urethra, rectum, etc., and to relieve the pain in malignant disease of these parts.

ÆTHER SULPHURICUS.

THERAPEUTIC ACTION.— As an internal remedy ether is stimulant, narcotic, and antispasmodic; its operation in large doses being somewhat similar to alcohol, but it is more diffusible and less permanent. It is sometimes employed as a stimulant in typhoid and other low forms of fever, especially when there is nausea, subsultus tendinum, and other spasmodic symptoms present; its action, however, being very evanescent, the remedy has to be very frequently repeated. By its stimulant influence it cures headache dependent upon a feeble cerebral circulation—atony. It is also employed to check nausea in cholera morbus and other diseases, and to relieve cramp of the stomach and pain of the bowels. As an antispasmodic, it has been employed in hysteria, spasmodic asthma, tetanus, etc.

Used as an anæsthetic by inhalation, it is supposed to be absorbed into the circulation, and acting from this deadens the sensibility of the nervous centers. Its effects are sometimes partial, pain being completely averted in operations of the most painful character, while consciousness is retained unimpaired.

Etherization is a safe and important mode of averting the pain and severity of the shock which the system would sustain in severe surgical operations. Even the actual cautery may be used without causing pain. Ether is employed many times as a relaxing agent, or to counteract the rigidity of the muscular fiber, in a variety of cases, among which may be named strictures of the urethra and œsophagus, strangulated hernia, retention of urine, dislocations, fractures, and anchylosis. In all these cases, the necessary surgical manipulations are very much interfered with by the muscular contractions excited by pain. This is particularly the case in dislocations, and in fractures attended with shortening of the limb. In partial anchylosis, etherization enables the surgeon in many cases to break up the adhesions without pain to the patient or resistance from the muscles. Even in lithotomy and lithotrity, the incidental advantage is gained of preventing or lessening the inordinate contraction of the muscular coat of the bladder. In short, in most cases in which the necessary surgical measures are likely to be involved in severe pain, or to encounter resistance, as in children, etherization may be usefully employed. Etherization is resorted to as a palliative in neuralgia and tetanus, and to counteract the effects of over-doses of strychnia. It has likewise been used in asthmatic affections and chronic bronchitis as an expectorant, and as an anodyne and antispasmodic in dysmenorrhœa.

Ether is a popular anæsthetic in cases of midwifery. It not only lessens the pain attendant upon parturition, but facilitates that process by securing a relaxation of the rigid soft parts, and promoting the secretions which serve to lubricate these, while it does not interrupt the contractile powers of the uterus.

Puerperal convulsions, tetanus, neuralgia, and delirium tremens, may be named as additional cases or diseases in which the use of this anæsthetic agent has afforded much relief.

The most convenient mode of exhibition, and the one now usually adopted, is by napkin or handkerchief folded and cupped, upon which the ether is poured in small quantities.

CHLOROFORM.

DOSE.—From five to twenty drops.

THERAPEUTIC ACTION.—Chloroform is said to be narcotic, stimulant, sedative, anodyne, antispasmodic, anæsthetic, febrifuge, and antiperiodic.

Taken internally in large doses it occasions a general diminution of sensorial powers, with drowsiness or deep coma, stertorous breathing, complete relaxation, sometimes frothing at the mouth, rarely convulsions, perhaps death. In most instances no material influence is exerted on the action of the heart. Its effects may last from a few minutes to one or two hours, according to the period of inhalation.

Animals destroyed by chloroform present no evidences of any peculiar action upon the organs. The blood found in the left cavities of the heart is dark, clearly indicating the action of the heart after respiration ceased. In certain cases excessive depression of the heart's action occurs in man, and sometimes death. Too large a quantity inhaled causes a feeble pulse, and sometimes a prolonged deliquium, requiring powerful stimulants to restore consciousness. In death from chloroform, the lungs were found congested, and patches of pulmonary apoplexy were witnessed.

Its liability to induce nausea is one objection to its use; nevertheless, it has been advantageously exhibited to arrest chronic vomiting from nervous causes, as in pregnancy.

As a local agent, chloroform has been used in a great variety of cases.

In obstetrical practice it has been applied to the perineum in case of rigidity and excessive pain.

In dysmenorrhœa it has afforded entire relief by introducing a sponge imbued with the chloroform through a tube into the vagina, so as to bring the vapor in contact with the os uteri. It has been applied to the sacrum, in the same case, with a mitigation of the sufferings.

Applied to cancers, it affords relief, and was used for this purpose in 1843 by Mr. Tuson.

Great relief has been obtained by the topical application of chloroform in cases of lumbago, sciatica, and other rheumatic and neuralgic affections. It is, indeed, an important palliative, and may aid in effecting a perfect cure.

It relieves pain by its narcotic action, it being absorbed into the circulation and acting on the nerves; it acts primarily, however, as a revulsive, inducing redness and irritation, and even vesication may follow its application.

It has afforded great relief in mastodynia or inflammation of the mammary gland. Applied to the vulva previous to the application of caustics, or to the urethra, secures entire immunity from pain; and when applied to the surface previous to the use of the potassa fusa in the formation of an eschar, it is equally valuable in rendering that extremely painful operation painless.

Chloroform is said to have afforded relief in cases of cholera, applied over the epigastric region. It has likewise been applied over the abdomen in spasm of the bowels and other violent painful affections, such as the passage of renal calculi through the ureters, or the passage of biliary calculi through the hepatic duct.

Experiments have been made showing that it is antiseptic, or that it possesses the power of arresting putrefaction.

Earache is another painful affection in which it has been advantageously used.

It has been used in "cancer, senile gangrene and sloughing ulcers, and, in the form of an injection, in profuse discharges from the uterus, and as a gargle in foul ulcers of the throat, with the effect of relieving pain, destroying fetor, and promoting the separation of diseased parts."

It has likewise been applied to painful wounds and ulcers, swelled testicles, in rheumatic ophthalmia, acute spinal pain and tenderness, lock-jaw, toothache, local spasms and painful local affections, atonic quinsy, and in the form of an ointment to papulous eruptions, and in sundry other affections too numerous to mention.

A third and perhaps more important mode of use as a therapeutic agent, is by inhalation.

A full dose of chloroform, exhibited by way of inhalation, causes loss of consciousness, general relaxation and entire loss of sensibility.

Chloroform possesses advantages over the sulphuric ether in the smallness of the dose required to produce the desired effect, in its prompt action, more agreeable effects, less tenacious odor, greater cheapness, and the greater facility with which it may be taken.

Chloroform has been extensively used in obstetrical practice to relieve the sufferings of the parturient female. It not only relieves pain but facilitates labor. Its use favors various operations, as turning, change of position, etc., and the application of the forceps.

Chloroform is likewise used by the surgeon under a variety of circumstances. It not only facilitates the operation of the surgeon, but renders the severest operations painless, and increases the prospect of a speedy cure.

The reduction of fractures and dislocations, the amputation of limbs, the extirpation of tumors, the operations of lithotomy, couching, etc., and the reduction of strangulated hernia, as well as many other operations, of a minor character, are performed with greater facility and with greater safety to the life of the patient, as well as with freedom from pain while in a state of anesthesia, than while laboring under a state of extreme fear and anxiety, together with intense pain and the muscular rigidity or tension of the animal fiber which always exists, and which often frustrates the maneuvers of the most skillful operator, and may defeat the operation altogether

Chloroform has been employed by inhalation in various painful spasmodic affections, among which may be named convulsive hysteria, hiccough, asthma, nephritic colic, tetanus hydrophobia, and also in delirium tremens, tic douloureux, and noisy insanity.

The danger attendant upon its exhibition is not to be denied when it is administered by reckless or incompetent hands; nevertheless when we consider the immense number of patients to whom it has been administered, and the small mortality that has followed its use, it is certainly evident that its exhibition is not very liable to be accompanied with fatal consequences.

The most convenient inhaler is a handkerchief loosely folded, which is to be sprinkled with chloroform and held over the mouth and nose in such a manner as to admit a due admixture of atmospheric air with the vapor of chloroform. Suspend the inhalation as soon as insensibility is attained, and upon the first evidence of returning consciousness again resort to the inhalation if necessary, remembering in all cases to refrain from its use soon after eating, and in cases of epilepsy and organic affections of the heart.

When its effects are carried to excess, the horizontal posture, cold air, fanning the face, cold water to the head and face, frictions and heat to the extremities, ammonia to the nostrils, and lastly, should all these measures fail to restore the patient, artificial respiration should be employed.

CHLORIC ETHER.

Dose.—One ounce or more may be inhaled from a sponge, or from a handkerchief.

Chloric Ether is a mere dilution of Chloroform with Alcohol, as prepared by many, consisting of one part of Chloroform and eight of Alcohol, although the strength varies; as prepared by Dr. Warren under the name of Strong Chloric Ether, it consists of one-third pure chloroform and two-thirds nearly absolute alcohol. It is an alcoholic solution of chloroform, or a tincture of chloroform.

Dr. Warren has used this preparation with entire success in a large number of cases, and considers it safer than the chloroform, and much more agreeable than the ether, it being less liable to produce pulmonary irritation or headache, but more apt to produce nausea, which Dr. W. thinks no disadvantage, but rather an advantage. Dr. Knight of New Haven, and other surgeons of eminence, corroborate the favorable views expressed by Dr. Warren of its anæsthetic powers.

NITROGENII MONOXIDUM.

Preparation.—Nitrous oxide gas is prepared by heating nitrate of ammonium (pure) to 392°, and afterward a little higher, when it is decomposed, giving the gas and water. The gas is passed through warm water into a receiver.

Therapeutic Action.—Inhaled, this gas produces exhilaration (hence its name, "laughing gas") and then transient anæsthesia. It is hardly worth our while to inquire here how this loss of sensibility is produced, whether it is by preventing the excretion of carbonic acid gas—asphyxia—or whether it influences the nerve cells directly, like ether or chloroform. The evidence favors this latter view

Nitrous oxide is the safest anæsthetic known; being used principally for the extraction of teeth, it has been administered a larger number of times than all other anæsthetics, and the deaths have not been more than one in one hundred thousand. Its stimulant effect is sometimes disagreeable, patients being violent or pugnacious as they are going under its influence.

It is adapted to minor operations, when one to five minutes are sufficient; for though patients may remain under its influence longer, it is not to be depended upon.

CARBONEI BISULPHIDUM.

Therapeutic Action.—Bisulphide of carbon was introduced by Prof. Simpson, of Edinburg, as a very active anæsthetic, but its use has not borne out his good opinion of it. It increases the frequency of the pulse, causes giddiness and unpleasant visions, and quite frequently nausea and vomiting. It is not used internally.

It may be used as a local anæsthetic, and diminishes the sensibility of the skin to such a degree that minor operations can be performed with little pain. It has been used in earache and inflammation of the ear, for toothache, and very dilute (dropped in hot water) to the eye in irritable states of the conjunctiva.

CARBONEI TETRACHLORIDUM.

Chloro-carbon is a thin oily liquid, which produces anæsthesia by inhalation of its vapor. It is a dangerous anæsthetic, however, and is not now employed.

AMYL NITRIS.

THERAPEUTIC ACTION.—When Nitrite of Amyl is inhaled, the face becomes flushed, the pulse and respiration are accelerated, but the temperature lowered. If continued, the pulse becomes frequent, small and thready, respiration very rapid, and the skin cyanotic.

It is not employed for the ordinary uses of an anæsthetic, but rather to relieve pain. Thus it has been used in neuralgia, in headache, toothache, earache, angina pectoris, dysmenorrhœa, and to arrest the attacks of epilepsy.

It has been employed in India for the cure of ague, using it alone, or in association with moderate doses of quinine. Dr. Sanders says that there is ample proof that it tends to check the retnrn of the attacks, and removes to some extent the septic condition of the blood, induced by the malarial poison. He employed nitrite of amyl with an equal part of oil of coriander, of which four drops were poured on a small piece of lint, and put in the hands of the patient with directions to inhale freely. "He soon became flushed, and both his pulse and respiration much accelerated. When he feels warm all over, the inhalation is discontinued as the symptoms continue to increase for some time afterwards. A profuse perspiration now sets in, which soon ends the attack."

DIVISION III.

CLASS IX.

REFRIGERANTS—ANTIPYRETICS.

REFRIGERANTS are defined to be those agents, which, when taken internally, or applied externally, lessen the morbid temperature of the body. This they may effect in two ways; first, by checking the process of combustion; and second, by the direct abstraction of heat.

Heat is produced in the animal body by the oxydation of certain components of the food and of the tissues of the body; the heat produced bearing a direct ratio to the amount of oxygen consumed, or to the amount of carbonic acid gas exhaled, and water formed by the union of oxygen with hydrogen. Though oxygenation first takes place in the lungs, yet we do not find an increased amount of heat in them, but the reverse; the constant evaporation of water in expiration tending to keep their temperature below some other portions of the system. Arterial blood is a carrier of oxygen, as is proved by its altered color after its passage through the lungs, and this color, the effect of oxygenation, continues until it has passed through the smaller capillaries. In the capillary system, then, we may look for the oxygenation of such material as will answer the process of combustion; and in this system of vessels we doubtless have the evolution of caloric. Heat, then, is very equitably distributed through the body; the parts, however, furthest distant from the center of circulation being somewhat the coolest. We find also that in health the system possesses within itself a regulating power, by which the combustive process is augmented in activity when increased calorification is required, or slackened when the temperature becomes too high. This is accomplished by an appetite for certain varieties of food which furnish a proper pabulum for combustion, and an increased activity of the respiratory organs in the one case, and for articles of diet of an opposite character, and decreased respiratory action in the other.

"The means provided by nature for cooling the body," says Dr. Carpenter, "are of the simplest possible character. From the whole of its soft, moist surface, simple *evaporation* will take place at all times, as from an inorganic body in the same circumstances; and the amount of this will be regulated merely by the condition of the atmosphere, as to warmth and dryness. The more readily watery vapor can be dissolved in atmospheric air, the more will be lost from the body in this manner. In cold weather, very little is thus carried off, even though the air be dry; and a warm atmosphere, already charged with dampness, will be nearly as ineffectual. The skin, as already mentioned, contains a large number of glandulæ, the office of which is to secrete an aqueous fluid; and the amount of this *exhalation* appears to depend solely or chiefly upon the *temperature* of the surrounding air. Thus, when the external heat is very great, a considerable amount of fluid is transuded from the skin; and this, in evaporating, carries off a large quantity of free caloric, which would otherwise raise the temperature of the body. If the atmosphere be hot and dry, and also be in motion, both exhalation and evaporation go on with great rapidity. If it be cold, both are checked, the former almost entirely so; but if it be dry, some evaporation still continues. On the other hand, in a hot atmosphere, saturated with moisture, exhalation continues, though evaporation is almost entirely checked.—We learn from these facts the great importance of not suddenly checking exhalation by exposure of the surface to cold, when the secretion is being actively performed; since a great disturbance of the circulation will be apt to ensue, similar to that which has been already mentioned, as occurring when other important secretions are suddenly suspended."

In febrile diseases the abnormal increase of the temperature may arise from two pathological states of the system;

first, from any cause that will produce increased disintegration of the tissues, a more rapid circulation of the blood, and increased respiratory action, and consequent oxygenation; and second, from any cause that obstructs or diminishes cutaneous transpiration, which is the great *frigorific* means of relieving the system of superabundant heat. In inflammation the increased heat is probably dependent upon the increased amount of blood sent to the part, and upon the increased chemical changes going on in it.

We have already noticed the fact that if, from any cause, an increased disintegration of the tissues should occur, or if the vitality of the circulating fluids was depressed, either by the retention of an excretion, or other cause, an increased amount of combustible material would exist, and increased oxygenation would be necessary. To burn this and fit it to be eliminated, an increased respiration and rapidity of the circulation would be necessary, and the consequence of this would be an increased evolution of caloric; this gives us the principal symptoms of *fever*.

Action of Refrigerants.—Refrigerants act in four different ways: first, by directly diminishing the process of calorification; second, by the direct application of cold; third, by increasing the action of the skin, thus relieving the system of its superabundant heat; and fourth, by an artificial evaporation from the surface, for the same purpose.

Among the agents that act directly in diminishing the process of calorification, we might call attention to the class of direct sedatives already considered, and to all agents whose secondary action is sedative. A sedative diminishes the generation of heat in the body, by diminishing innervation, by controlling the action of the heart and lessening the rapidity of the circulation, and consequently of the respiratory apparatus. These effects are invariably followed by a reduction of the temperature, as the evolution of caloric in the system requires active innervation, circulation and respiration.

We have another class of agents, however, which, though not as efficient in this particular, yet are designated by the term refrigerants. These are the vegetable and some of the mineral acids, and the supersalts of the vegetable acids

These agents act, it is probable, in two different ways: First, they furnish a combustible material to the blood, which requires much less oxygen for its combustion than the nitrogenized tissues of the body. Then if the amount of heat evolved bears a direct ratio to the amount of oxygen consumed, these agents would prove direct refrigerants. Dr. Headland says: "In fact, I suppose that in fevers the supply of natural blood fuel is deficient; that the nitrogenized tissues are then oxydized to maintain the animal heat, causing not only wasting, but tending to keep up the fever by the excessive amount of oxygen demanded for this abnormal combustion; that in such a case the vegetable acid is well adapted to take the place of lactic acid, the natural fuel. For though in health the ingestion of such an acid is immediately followed by increased acidity of the urine, when used in fevers it does not pass into the urine. It is then disposed of, or burnt, in the blood." Second, they act as antiseptics, preventing or retarding the chemical changes going on in the blood and solids of the body, and thus directly prevent oxygenation and the consequent evolution of heat. We understand by the term disintegration or decomposition, when applied to the tissues of the body, a chemical change from a higher to a lower grade of organization. Such a change always gives rise to an evolution of heat, as we witness in the *calor mordaux*, or increased heat of the dead body, caused by rapid decomposition. These agents check this disintegration of the tissues, and consequently lessen the morbid heat of the body. Thus they prove very beneficial in typhus or typhoid fevers, and in all low forms of disease in which there is a typhoid or septic condition of the blood.

The direct application of *cold* is among our most powerful refrigerant measures; and not only so, but it is also one of the most agreeable to the patient when there is an excessive generation of heat. In fever, when taken internally, it operates as a direct refrigerant, reducing preternatural heat, lowering the pulse, and disposing to sweating. There are very few cases in which cold water, if desired by the patient, may not be taken in moderate quantities. Even in cholera infantum, where drinks of all kinds, though constantly desired, will be immediately ejected, we have found ice, or ice-water, in small quantities, to be of the greatest utility. The practice of physicians in former days, and even some at this time, of prohibiting entirely the exhibition of cold water, was certainly the most cruel, if not the most unphilosophical mode of treatment that could have been adopted. We have now the most vivid impressions, from actual experience, of what it was to have a fever in those days. Suppose a person with dry mouth, parched tongue—literally burning up—and with a thirst that might be called *horrible*, begging for but a spoonful of cold water to wet his parched lips; yet this was positively prohibited, upon the ground that it would probably kill the patient, or produce "*salivation*." If we had to take our choice between cold water, or a doctor with his lancet, calomel, ipecac, tartar emetic and Dover's powder, the regular saddlebag contents of former days, we should certainly prefer the first and omit the last.

Cold applications are employed with advantage in all inflammatory affections where there is general febrile reaction. In many cases they will be found to give more satisfaction than the "hot fomentations" so commonly employed. The rule that we observe in their use is, that if the system is in such a condition that a chill will not follow their application, and if the part to which they are applied is much above the ordinary temperature, they may be used with advantage; but if the contrary is the case, we apply warm applications. In the first stages of inflammation of the eyes, we may often entirely arrest the disease by the application of cold. Care, however, is required that the cold is not continued long enough to produce such a degree of refrigeration as will endanger the tissues of the eye. In other superficial inflammatory affections, cold may be often employed so as to speedily remove the disease. Cold applications to the head in phrenitis, in determination of blood to the head, etc., is one of the most common means resorted to, yet we have found that refrigeration by evaporation is much the best method of removing the heat in these cases.

Cold applied to the entire surface in febrile diseases, is often an important means of subduing or lessening the abnormal heat of the body. Its *primary* effect is that of a depressing and sedative agent; thus it lessens the heat of the surface, causes constriction of the capillary vessels, lessens nervous irritability, and diminishes the activity of the circulation. If long continued, it causes a determination of blood to internal organs, which are oppressed in their action. Its *secondary* effects (*reaction*) are the opposite of the primary effects: thus, there is determination to the surface, the skin is relaxed, and perspiration frequently results. External refrigerants are generally more effectual than those used internally. They are brought in direct contact with an extensive, highly vascular, sensitive and strongly sympathizing surface, and through this sympathy they exert a sedative influence upon the entire system.

The refrigerant effects of cold, in fevers, are obtained in two ways: by exposing the body to a draught of cold air, or by the application of cold water.

Cold air is frequently beneficial as a refrigerant; if the body is exposed to a draught of cold air, the increased evaporation and consequent refrigeration is grateful and salutary in its influence upon the system. It is necessary, however, that the entire surface should be affected alike; for if the air strikes but a portion of the body, a severe cold, with aggravation of the disease, will be very likely to result. Exposure to the air at a temperature of fifty or sixty degrees, without draught, is much safer, lowering the temperature of the body and reducing excessive vascular action. In febrile diseases, we always direct that the patient be lightly covered when the skin is hot, and, if possible, keep a free circulation of air in the room. We have found this especially useful in the treatment of scarlatina. In the first stages of the disease we keep the patient lightly covered, use the cool alkaline bath, and refrigerants internally; but as soon as the fever commences to subside, we direct them to be warmly covered, and mild diaphoretics administered to produce perspiration.

Cold water is employed as a refrigerant in the form of a *bath*, *affusion*, *shower-bath*, *douche*, *wet-sheet pack*, and as a *wash*

The temperature of the *cold-bath* ranges from 33° to abou 75°; when below 50° it may be considered very cold. Its primary effects are a sensation of cold, paleness of the skin, contraction of the cutaneous vessels and to some degree of those deeper seated, and diminished rapidity of the circulation. This is soon followed by reaction, the pulse becomes full and frequent, there is determination to the surface, with a softened state of the skin and perspiration. It has been employed as a refrigerant in fevers of a sthenic type, and many cases are reported in which it has immediately broken up the disease. Owing, however, to want of facilities to employ it, and the natural objections of patients to such rough treatment it is rarely used.

The *cold affusion, shower-bath and douche*, are rarely employed for their refrigerant influence, being better adapted to the treatment of local or chronic diseases. (see *Hydropathy*, Part I).

The *wet-sheet pack* is one of the most valuable modes of applying cold as a refrigerant in fevers. Its primary action is the same as the cold-bath,—diminishing the heat of the surface, lessening the rapidity of the circulation, and acting as a sedative to the entire system. Here, however, the analogy between the two ceases; for instead of a high reaction as is the case with the cold-bath, it is generally but sufficient to produce an agreeable degree of warmth; the pulse assumes its natural standard, the skin is relaxed, and perspiration established. We have often seen what promised to be a severe attack of fever, entirely subdued in its incipient stage, by the employment of the wet-sheet pack; and if it were not for the almost insuperable objections of patients to its use, we have no doubt that a majority of such cases would yield to its use with but little medication, if employed in the early stages. After the disease has progressed for some time we should not expect it to prove so decidedly curative, yet it will be found of great utility when not contra-indicated as an accessory means of treatment. The rules that we observe in its employment, are, that when the skin is hot, the pulse quick but not small, and perspiration suppressed, it may be used with advantage.

Sponging the body with cold water, as far as a simple refrigerant is desired, is a valuable mode of application, and much less objectionable to the patient than either of the others mentioned; there is no shock, the fluid being left to evaporate merely cools the surface, and by persevering in its application, the cooling effect is fully obtained and rendered permanent. When water is used in this manner, its temperature, as a general rule, should be but little below that of the body; but this is best regulated by the feelings of the patient. One great advantage of the *sponge-bath* is the facility of limiting the extent of the effect to the feelings of the patient, and of applying it even when lying in bed; as soon as the patient feels chilly, he should be carefully dried with brisk friction and warmly covered up in bed.

Dr. Thompson notices six varieties of fever in which the refrigerants named are indicated and prove useful:

"1. In inflammatory fever (synocha), a rare disease when unaccompanied with topical inflammation, the advantages to be derived from refrigerants are well understood. The cold affusion is admirably adapted for rapidly abstracting the stimulus of heat, diminishing general excitement, and operating as a powerful sedative. In the more advanced stages of the disease, cool sponging is often substituted for the affusion; but when the patient can bear the fatigue of the affusion, it is always to be preferred. The greater frequency of this form of fever among the ancients than the moderns (?) explains their constant employment of cold drinks and cold bathing in continued fever.

"2. In fevers of a typhoid type, the disease has been cut short by the cold affusion; but in this case more, perhaps, is to be attributed to the shock and the reaction which follows, than to the refrigerant influence of the affusion.

"3. In synochus, or continued fever, gradually assuming the typhoid character, refrigerants in general, but more especially the cold affusion, are chiefly applicable to the early stages of the disease; and, indeed, no form of remedy is more advantageous when there are no loca. determinations but when these exist, particularly if the lungs be affected, much caution is required.

"4. In remittent fevers, especially those of warm climates, and in their intense and more excited variety, the cold affusion may be employed with great benefit. In severe attacks also, much advantage is derived from the application of ice or cold water to the scalp. In the remissions, however, the application of cold in any form must be suspended. In yellow fever, the safety of the patient frequently depends solely on the early application of the cold affusion.

"5. If hectic be symptomatic of pulmonary affections, or determination to internal organs, the cold affusion is decidedly contra-indicated; but even in such cases much benefit is often obtained by sponging the trunk of the body with cold water, mixed with vinegar, while the lower extremities are kept warm in bed. We must, nevertheless, bear in mind that, under any form of hectic, although general refrigerants are useful auxiliaries, yet the cold affusion can scarcely be regarded as admissible.

"6. In eruptive fevers, except measles, the body should be freely exposed to cool air; and even the cold affusion may be safely and advantageously prescribed, should the state of the surface require it, nor should the presence of the eruption operate as a reason against its employment. The Hindoo physicians plunge their patients, during the eruption of small-pox, into cold water, and with the best results. It diminishes the fever, lessens the number of the pustules, and is said to prevent pitting. The writer of this article has long been in the habit of employing the cold affusion in scarlatina during the hight of the eruption, and has seen the severity of the disease instantly checked by it.

"In intermittent fevers, when the skin is dry and parched, and the general heat greatly augmented, cold in every form applied to the surface, and cold acidulated fluids taken into the stomach, are of the same value as in continued fever, and greatly favor the accession of the sweating stage."

The skin, as has been already stated, is the great refrigerating organ of the system; and when it is in a perfectly healthy condition, its functions being normally performed, it would be almost, if not entirely, impossible for an excessive degree of heat to exist. It must then be apparent that if by any means we can obtain a normal action of this tissue, refrigeration would be the consequence, and the agents employed for this purpose might be termed refrigerants. Thus diaphoretics and diaphoretic measures would become important agents of the class we are now considering. It is not our intention, however, to do more than merely refer to the importance of these agents as refrigerants in this place, as they have already been fully considered. The various external applications referred to not only act as direct refrigerants, but also indirectly in promoting the cutaneous secretion. As a very important mode of cleansing the skin, and stimulating it to increased action, as well as of producing direct refrigeration, we would here refer to the *alkaline bath*, so well and favorably known to Eclectic practitioners. Nothing, with which we are acquainted, so successfully cleanses the skin, removes the detritus of perspiration, and fits it for normal secretion. It is employed in all stages of febrile disease with perfect safety; its temperature being governed by the condition of the system.

Evaporation from the surface is one of the most powerful modes of refrigeration, heat being rapidly conducted from the system by the change of a liquid to a gaseous form. Thus in fevers where the skin is very hot, it may be soon brought down to a normal temperature, by sponging the surface with luke-warm water, and promoting evaporation by a current of air or by fanning. It is not in general disease, however, that it is employed with the greatest advantage. In inflammatory affections it proves more useful than any other form of external refrigeration, rapidly reducing the temperature of the inflamed part. We employ it in phrenitis, determination of blood to the head, etc., in preference to ice or ice-water; for we have found by experience that it reduces the heat as rapidly, is more agreeable to the patient, and there is no liability to that reaction which always follows the application of cold, if by any carelessness upon the part of the attendant, it is not continuously applied. In inflammation following injuries, it will also be found preferable in many cases to the direct application of cold. In some cases, as in injuries of the joints, if we wish to produce a more rapid refrigeration than can be obtained by the evaporation of water, we employ agents that evaporate very rapidly, as the sulphuric ether, chloroform, etc.

SEDATIVES.

As was remarked in the general description of this class, sedatives occupy a prominent place in the list of refrigerants or antipyretics. There is a direct relation between the temperature and the pulse; as the one goes up the other goes up; as the one comes down the other comes down; with each increase of one degree of heat, the pulse is increased in frequency ten beats per minute. The high temperature is associated with an equally frequent pulse; if the pulse is brought down, the temperature is brought down with it.

It is of no special importance to us to theorize upon this relation, the well established fact being a sufficient basis for therapeutics. That the nerves controlling calorification are intimately associated with those controlling the circulation, is a sufficient explanation of the interdependence of the two. As has been remarked, we control the processes of burning and the amount of heat produced.

Veratrum.—With a full and frequent pulse and high temperature we prescribe Veratrum (see Sedatives) and as the pulse comes down the temperature is reduced. Of course, if Veratrum does not diminish the frequency of the pulse, it will not lessen the temperature, but if the indications are followed the results are quite certain.

Aconite.—The pulse is small and frequent, the temperature high, and we select Aconite as the arterial sedative and antipyretic. In infantile fevers I have seen the tempeature brought down from 105° to 100°, in six or eight hours, by the administration of this remedy alone. Of course we do not expect so marked or so speedy a result in fevers produced by a blood poison, as scarlet fever, or where there is an active process of inflammation. Still Aconite is so certain in its action that it stands at the top of the list.

Gelseminum.—The face is flushed, the eyes bright, the pupils contracted, the patient restless, and the temperature markedly increased. These are the evidences of irritation of the cerebro-spinal centers, and which is met by the administration of Gelseminum. As the nervous system is relieved, the patient rests, the pulse comes down, and the temperature comes down. I have seen as marked antipyretic effects from this as from any remedy I have employed.

Belladonna.—The skin is flushed, bright or dull, and when the finger is drawn across it a somewhat persistent white line is left. There is capillary congestion of the skin, and it is not in good condition to regulate the temperature. There is congestion of the basilar brain—the patient is dull, sleepy, comatose, and in consequence of this respiratory innervation is deranged, and the temperature runs high. In either of these cases Belladonna exerts a direct influence in lowering the temperature. In the one case it relieves congestion, and puts the skin in condition to remove the excess of heat; and in the other it regulates the fires of life.

Rhus.—The patient complains of burning heat, the pulse is frequent and *sharp*, and the skin dry. Rhus relieves the peculiar excitement of the nerve centers, lessens the frequency of the pulse, puts the skin in better condition, and thus lowers the temperature. When indicated it is one of the most direct of antipyretics.

STIMULANTS.

It may seem a little strange to talk about reducing the temperature by the administration of stimulants, but it is a means to be thought of in low grades of disease. The patient is maintaining a high temperature by burning his body. The nerve centers are irritated by this burning, respiration is frequent, the secretions are arrested, and the skin is so harsh and dry, that the heat can not escape. The digestive organs have been so impaired by the disease and by medicines that food can not be taken.

If the patient is to recover the temperatnre must be brought down, and to do this, combustion of the tissues must be stopped. As we can not give food we give alcoholic stimuli—whiskey largely diluted, brandy diluted, wine, and rarely malt liquors. This furnishes material for combustion, relieves the body, lessens irritation, and diminishes the temperature.

Whilst this accounts for the antipyretic action of alcohol in many cases, it may be further stated that it directly reduces the temperature in other cases when there is no need of calorifacient material. I have already noticed the fact that sweet spirits of nitre is a sedative, and this, as well as many of the ethers and alcohols, directly lower the temperature.

ANTIPERIODICS.

All the direct antiperiodics exert an antipyretic action in some conditions. But unless directly indicated they do harm rather than good by this influence. It is a very great mistake to think that because the calorifacient function can be depressed by poisonous doses, the depression will be an advantage if the life is impaired as well.

QUINIA SULPHAS.—Of late years, it has been taught that quinine is an antipyretic, and students and physicians have been advised to use it for this purpose. There is a small amount of truth in this, but it is associated with a great error.

We understand that there is a peculiar cause of disease which gives rise to *periodicity*. This is a distinctive feature in intermittent and remittent fevers, and is met by an antiperiodic—by quinine. This cause has been given the name of "malaria," but as we do not as yet know what malaria is, it is well to give our attention wholly to the expression of disease—periodicity.

If a fever has this element, quinine is antipyretic. I have seen the temperature fall from 107° to 100° under the influence of twenty grains. Whilst it may thus reduce the temperature at any stage of the fever, it is well to follow the teaching of Prof. I. G. Jones. "In a remittent fever with high range of temperature and brief and scarcely noticeable remission, commence the administration when the fever (temperature) has reached the highest point, or when the first evidence of a decline is noticed. Now if quinine is given in five grain doses there is a remarkable fall in the temperature, and probably with the third dose we reach 100° or it may be 98°; with two or three days of such action the fever is arrested and the patient convalesces."

This should be clear enough to intelligent men, but to doctors it reads something like this—Smith has a fever (remittent) with high temperature, I give him quinine and the temperature is markedly reduced and the patient is cured. Jones has a fever (continued or typhoid) with high temperature, and because quinine lowered the temperature in the case of Smith I will give it to Jones—result, irritation, restlessness, and further impairment of junction. The difference between a remittent and a continued fever has not been estimated.

Reasoning from false premises in this way, our neighbors have given quinine for everything in the shape of a fever. They have boldly taught that if the moderate dose of five grains does not lower the temperature, then give the drug in ten or twenty grain doses. Recently some of the more intelligent teachers have seen the error and expressed doubts as to whether there are any antipyretics.

ANTIRHEUMATICS.

In rheumatic fever and acute inflammatory rheumatism a high range of temperature is a prominent feature. In this case, as in that requiring antiperiodics, there is a specific cause upon which the temperature as well as other symptoms depend. If this cause is destroyed, removed or antidoted, the temperature falls, so that in these cases the antirheumatics are real antipyretics. I think the reader will have no difficulty in seeing the relationship between the special cause, the increased temperature, the special remedy and the reduction of heat.

SALICYLIC ACID.—It has been claimed that Salicylic Acid was a direct antipyretic, and that the temperature in fever and inflammation might be controlled by its use. As usual, the doses have been largely increased until ten to twenty grains were given; now it is conceded that it was all a mistake, and there are no antipyretics.

But there is a rheumatism that Salicylic Acid will cure, and if these cases had been thoroughly studied, instead of theorizing, we might have had the special symptoms pointed out, so that we could use the remedy intelligently. When it is antirheumatic it will be found to lessen the temperature when administered in the ordinary dose of two or three grains.

SALICYLATE OF SODA. SALICYLATE OF POTASH.—In many cases we prefer these salts to this acid itself. In prescriptions we frequently order: ℞ Salicylic Acid ʒj., Acetate of Potash ʒij., water ℥iv.; dose a teaspoonful. ℞ Salicylic Acid ʒj,. Bicarbonate of soda ʒij., water ℥iv.; dose one teaspoonful.

If in rheumatism the tongue has a bluish pallor these preparations are likely to be successful. In rheumatic fever and inflammatory rheumatism I have seen the heat reduced from 103° or 104,° to 99°, and held there until the patient was freed from the rheumatic poison.

Macrotys.—The rheumatism is uterine or ovarian, or the pains are muscular, or seem to be intensified by muscular contraction. In such cases Macrotys, by opposing the rheumatic cause, and relieving irritation, brings the temperature down to the normal standard.

Bryonia.—The pulse is full and hard, the pain sharp and lancinating, the serous membranes are involved. Here Bryonia is sedative, lessening the frequency of the pulse, taking away its hardness and giving a better circulation. At the same time it is antipyretic, reducing the temperature by its direct action. The same result will be obtained when the remedy is given in pleuritis, pleuro-pneumonia and peritonitis, the indications for this remedy being present.

The same is true of other remedies which influence the rheumatic poison—Apocynum, Phytolacca, Sticta, Rhus, Colchicum, etc.

ANTIZYMOTICS.

We have a group of remedies which antidote the zymotic causes of disease, or oppose zymotic processes, and these are markedly antipyretic when indicated. It is a repetition of the same story. The zymotic poison is the cause of fever, and the frequency of pulse, the excited nervous system, and increased temperature are dependent upon it. If this cause is removed or destroyed the effects cease. We have remedies that possess this antizymotic power, and they are of first importance in these cases.

Phytolacca.—There is soreness of the throat with diphtheritic exudation. The pulse is frequent and the temperature high. In this case we find that phytolacca not only relieves the irritation of the throat and strengthens its tissues, but it lessens the frequency of the pulse and the temperature. No remedy exerts a more marked antipyretic action than does this in a case of diphtheria with high temperature.

BAPTISIA.—The face has a bluish appearance like one who has been exposed to severe cold; the tongue has a like fullness with purplish coloration. This describes a condition met with in zymotic and some other forms of disease. The pulse is frequent and the temperature high, and the usual sedative and baths do not exert their usual influence. We note the indications for Baptisia and give it with the effect of lessening the frequency of the pulse and bringing the temperature down.

SULPHITE OF SODA.—The tongue is broad, pallid and dirty, and with a frequent pulse we have a high range of temperature. In this case the ordinary means will fail to produce sedation, and bring down the temperature. Now if sulphite of soda is given in five, ten or fifteen grain doses we find the patient is impressed in all directions. The temperature is lowered, the pulse reduced in frequency, the nervous system relieved, and secretions established. In this case the sulphite of soda is a most powerful refrigerant.

SULPHUROUS ACID.—The tongue is red, moist, and covered with a glutiness nastiness, the temperature is high. In this case Sulphurous Acid will bring down the temperature, lessen the frequency of the pulse, and put the patient in better condition in every function.

CHLORATE OF POTASH.—The lochial discharge is offensive, and from the absorption of putrerescent material, there is an exalted temperature with frequent pulse, and excited nervous system. I take a special case because it illustrates the action of the remedy. If now, chlorate of potash is given, a most marked influence will be observed in bringing down the temperature and pulse, relieving the nervous system and restoring the secretions.

MURIATIC ACID.—The tongue is dusky-red, dry, fissured, and covered with a brown sordes, the patient is suffering from continued or typhoid fever, and carrying a temperature of 104°. Sedatives have been used without good effect. Baths do not serve the purpose of putting the skin in condition for the removal of the surplus heat. All medicines are suspended and the patient is freely supplied with water acidulated with Muriatic Acid, and soon we notice an improvement. The pulse comes down, the temperature comes down, the secretions are better, and the patient takes food. The antipyretic influence is so marked that no one can mistake it.

ACIDS.—We observe the same effects from other acids. Our Irish fellow citizen drinks his whey and lessens the burning. A Jerseyman takes kindly to cider, and finds that it cools him off. The patient in the South has lemonade or orange juice, and feels the better for it.

ALKALIES.—The tongue is broad and pallid, the patient is carrying a high temperature, and the ordinary remedies fail to give relief, we give a weak solution of bicarbonate of soda freely, and the patient is relieved and everything acts kindly. Under the influence of the soda the temperature falls two to four degrees in twelve hours.

FOODS.

It must not be forgotten that in many diseases when a high temperature is maintained, the body is being burned, and in consequence of the irritation from this burning, the processes of calorification are increased If by any means we are able to lessen the burning of the tissues, we diminish the temperature. Whether we slow the fires by the use of the arterial sedatives, lessening nerves excitability, or furnish material for combustion, we reach the same result.

Thus, we say that in these cases the patient should have a steady supply of calorifacient food to take the place of the burning body. As we furnish it, and see that the digestive apparatus is in condition to receive it, we find that the temperature falls. It may seem singular that a body will be cooled by furnishing good material for burning, but it is none the less a fact.

In idiopathic or symptomatic fevers, with high temperature, if we can give the patient a constant supply of food, we can control the temperature. If food can not be taken, or the physician prefers medicine to food, there is a probability that the patient will be burned up. Hot milk is a standard food in these cases. Not that we oblige every one to take it, for if there is a distaste for milk, we can select other foods of similar character. But if the patient takes his milk kindly, we are sure we are getting along well.

This applies to chronic desease in which increased temperature is a prominent feature. Take a case of pulmonary phthisis, and with a temperature of 102°, the patient is going to his funeral as fast as he can. Bring the temperature down to 100° or 99°, and all the unpleasant symptoms are relieved. This is sometimes accomplished by cod-liver oil, or by cream, or by whisky, but in the majority of the cases a supply of calorifacient food, properly appropriated, will be a prominent means of amendment.

Baths have been fully considered in the introductory remarks, and we have only to add that the means directed to the skin should be carefully studied. Nothing gives greater success in the practice of medicine than the ability to adapt means to special conditions. A good condition of skin is to be sought for in all diseases having an increased temperature as a prominent feature.

DIVISION IV.

CLASS X.

TONICS.

TONICS are medicines which produce a permanent exaltation of the energies of the general system, without materially increasing the vital manifestations in any particular organ. They give tone to the muscular system without increasing the temperature of the body or rapidity of the circulation, producing no immediate and marked excitement like stimulants. Their influence is manifested by a very slow and permanent exaltation of organic action, evinced by an increased force of the circulation, and increased muscular power. The heart contracts with more force, but its contractions are not increased in frequency; the pulse acquires fullness and firmness, and loses that soft, flaccid and atonic character which is a manifestation of debility. The protracted use of tonics may produce an increased temperature of the body and an acceleration of the pulse; but these are but secondary effects arising from increased nutrition.

From what has been said of the influence which they exert, it will readily be seen that they are particularly adapted to atonic states of the system. Their primary sanative impressions are doubtless made upon the nervous system, while the manifestation of these impressions is seen in the increased tone of the muscular system, in the improved state of the secretions, in the augmented force and fullness of the pulse, and in the increased rapidity and perfection of digestion. The increased energy which they impart to the nervous system, the impetus which they give to the circulation and the improvement in the digestive functions, together with the increased secretion and absorption which they effect, are among the many evidences of their sanative powers.

Very peculiar, and apparently very dissimilar effects upon the secretory organs and tissues follow from the use of tonics, under different pathological conditions of these organs and tissues. When the secretions become abnormal and superabundant, from an atonic state of the secretory organs, this class of agents have the power to restrain and control them. Thus, if the cutaneous exhalation becomes superabundant from debility, as is the case in the advanced stages of phthisis, typhus and typhoid fever, etc., tonics often promptly restore the tone of the system and arrest it. Also, in phthisis and other diseases of the respiratory apparatus, when the secretion from the lungs becomes excessive from debility; and when this discharge would tend to increase that debility, tonics, combined with astringents, are of much value in arresting the secretion. The same remarks apply to diabetes, chronic diarrhea, leucorrhea, menorrhagia, passive hemorrhages and passive dropsies; in all of which cases, tonics will be found important auxiliary agents in restraining the morbid discharges. When, on the contrary, the secretions are lessened or arrested from torpor or atony of the organs, or from a languid or enfeebled state of the circulation, or of the general system, tonics are by no means an unimportant class of agents in aiding in the reëstablishment of them. If the kidneys, skin, uterus or lungs, fail to furnish their due secretion, from a torpid state of the organ, or from an enfeebled state of the general system, tonics are of much importance in restoring them; in such cases they exert a diuretic, diaphoretic, emmenagogue and expectorant influence.

Tonics are mostly derived from the vegetable kingdom, and are remarkable for their bitterness; though from the similarity of their action, we include in this class the mineral acids and the chalybeate preparations.

The chalybeates do not, like the bitter tonics, act topically upon the stomach and alimentary canal, imparting new vigor to the parts with which they come in contact. They act on the restorative principle entirely; being absorbed, they supply a material to the blood, improving its quality, and in this way exert a tonic influence upon the entire system. Iron is found to be an important ingredient in the red globules of the blood; and when these globules are deficient, as they are in anemia, the administration of iron will cause a regeneration of these, and a restoration of the system to health.

Action of Tonics.—Tonics act in two ways upon the system, producing their restorative effects.

1st. By their topical influence they give increased nervous and muscular energy to the stomach and bowels, and stimulate the mucous membrane to normal action; they thus improve digestion, increasing the appetite, and improving the quantity and quality of the chyle. If digestion is imperfect, the chyle must be unhealthy and scanty, and as the chyle supplies the material for the formation of the blood, which in turn supplies the system with the material to replenish the waste of tissue, and for the growth of the body, it is evident that normal digestion must be carried on, if the system maintains its healthy functions. Tonics, then, by their influence over the alimentary canal, prove indirectly restorative, by increasing the appetite, increasing digestion, chymification and chylification, and furnishing a healthy pabulum, both in quantity and quality, for the formation of the blood.

2d. All of this class of agents are readily soluble in the fluids of the body, and hence are absorbed into the circulation, and act from it upon every part of the system. We have already seen that they exert a tonic and strengthening influence when topically applied to the stomach; and we may notice a similar influence, from their application to indolent ulcers, wounds, etc., when applied so that we can notice their effects. If this is the case then, that they impart strength and tone when brought into contact with the tissues, as it undoubtedly is, we have a solution of their effects after absorption. The circulation conveys them to every part of the system, they are brought in contact with every fiber and every cell; and if they act in the circulation as they do when topically applied, they give new energy and tone to every part.

They likewise act as restoratives in many cases, adding to the blood some material that was deficient in it. In this way both the vegetable bitters, iron, acids, and alkalies act as tonics. For a further description of the action of these remedies see general therapeutics.

Tonics not only produce their specific impressions when taken internally, but also when applied to the surface of the body, from which they may be absorbed. Their external application is of much importance in all cases where there is extreme debility, and when the stomach is weak and irritable, and will not tolerate the use of medicine. In all cases of extreme debility, they may be used as a bath, or by enema, when they will exert their ordinary invigorating influence upon the system. In the "night-sweats" of debilitating diseases, they are often of much advantage, strengthening the skin and checking the morbid secretion.

Their topical application deserves a passing notice. They are frequently applied to old atonic and indolent ulcers, and also to gangrenous parts, as topical tonics, with much advantage. We thus cleanse the gangrenous or ulcerated parts thoroughly and frequently with a strong decoction of the tonic, and also apply it in the form of a poultice mixed with slippery-elm.

THERAPEUTIC INDICATIONS.

Tonics are administered with much advantage in *dyspepsia.* When the stomach is debilitated, its coats do not act with the necessary energy upon the alimentary mass, and the gastric secretions are either scanty, or do not possess their proper solvent powers, and chymification will therefore be imperfect, and the train of dyspeptic symptoms follow. These results are counteracted by the use of tonics, in the manner already referred to.

In all cases of asthenia they are indicated, unless it be connected with some local inflammatory affection that would be aggravated by their use. They become important agents in the advanced stages of most of the acute diseases, after fever has subsided, and when high inflammatory action no longer exists; in such cases they enable the system to throw off the disease, and render convalescence much shorter. In adynamic fevers, as typhus gravior, typhoid, scarlatina maligna, gangrenous erysipelas, or in any case where there is a tendency to gangrene or putrescency, they are agents of the first importance. In smallpox, where the vital powers are much prostrated, in carbuncle, scorbutis, scrofula, and other similar affections, their employment constitutes an important part of the treatment. They are also indicated in passive dropsies and hemorrhages.

Debility of a single organ or of the entire system, predisposes to the morbid influences of surrounding causes of disease, as the infection of certain contagious diseases, changes of temperature causing the retention of a customary secretion, the morbid effects of miasmata, etc. Tonics aid the enfeebled energies of the system in warding off these extraneous causes of disease. Malarious influences occasionally produce almost every variety and type of fever, particularly the intermittent, beside many anomalous diseases which have a more or less periodic character. Hence we have headache,—especially hemicrania,—neuralgia, toothache, rheumatism, deafness, dyspnea, convulsions, etc., assuming a periodic form. It has been proved beyond cavil, by medical reports from the malarious coast of Africa, that tonics administered as prophylactics, are a certain preventative against this influence.

In diseases marked by a periodic character the most powerful tonics are administered. Some of them are supposed to possess *antiperiodic* in addition to their tonic properties, and are therefore called *antiperiodics*. The cinchona and its alkaloid principles are examples of this kind. The question then arises, do tonics arrest these periodical diseases by virtue of their tonic properties alone, or are they possessed of *febrifuge* or *antiperiodic* powers in addition to these. The latter view appears the most probable, for we find that those agents which act as antiperiodics possess but feeble tonic properties, in diseases in which this periodic element is lacking; that is, they do not increase the appetite, improve digestion, etc., in cases of common debility. These agents may likewise be administered in any stage of the fever, and if the stomach is not in an irritable condition, they will lessen instead of increasing the pyrexia. Why certain agents of this class exert this peculiar antiperiodic property we are unable to explain, any more than we are why some causes produce periodic fever; the fact, however, is evident that some of them possess a power over this form of disease that is not possessed by others of the class.

As probably the best explanation of the action of the antiperiodic tonics we will introduce two quotations. Liebig in considering this subject, says:—"This action is commonly said to be dynamic—that is, it accelerates, or retards, or alters in some way the phenomena of motion in animal life. If we reflect that this action is exerted by substances which are material, tangible and ponderable; that they disappear in the organism; that a double dose acts more powerfully than a single one; that, after a time, a fresh dose must be given if we wish to produce the action a second time; all these considerations viewed chemically, permit only one form of explanation; the supposition, namely, that these compounds, by means of their elements, take a share in the formation of new, or the transformation of existing brain and nervous matter." Dr. Wood says in relation to this subject: "I know of no better explanation of the antiperiodic property, than that which supposes it to depend upon the powerful influence exercised by the remedy upon the nervous centers, through which probably the paroxysms are produced. Every consideration in connection with the peculiarities of regular intermittent diseases, leads to the conclusion, that the paroxysms are produced by an influence acting through the cerebral centers, without which the result would not take place. Now, if these cerebral centers can be preöccupied by a strong impression from some other source, they may be rendered insensible to the morbid influence, and the paroxysm, therefore, is set aside."

In addition to this influence upon the nervous system, antiperiodics undoubtedly exert a specific and decided influence upon the blood. This they may do in two ways:—First, by counteracting the chemical changes going on in that fluid,—preventing the septic action of the morbid material (which we suppose to be the cause of the fever) upon the blood They also give increased vitality to the circulating fluids, (see *antiseptics*). Second, by causing an increased elimination, they remove the cause of the disease. We have long since arrived at the conclusion, that *quinia*, which may be taken as the type of the antiperiodic agents, owes its virtues in part, in periodic diseases, to its action on the excretory organs. When successfully administered it invariably causes relaxation and increased secretion from the skin, and this secretion gives evidence by its sensible qualities of an increased elimination of solids. It likewise increases the action of the kidneys, and consequently elimination by this channel. To sum up then, we may say, that antiperiodics act upon the nervous centers, increasing innervation, and changing the character of nervous action; that they act as *tonics*, increasing the vital force of the system; that they act as *antiseptics*, counteracting the septic tendency in the blood; and that finally they act as *eliminatives*, removing morbid material from the system.

In conclusion we may say in reference to this class of agents, that their use is indicated whenever the system is depressed below its normal level. They act directly in support of the vital force, and not as is the case with stimulants to produce merely nervous excitation; they therefore assist nature in the removal of disease. "Tonics," says Headland, "are among the most useful of all medicines. And it is certainly not the least of their recommendations, that we can seldom or never do harm by their use. They are remedies, but not poisons. Many a man has been killed by opium, many a constitution ruined by mercury, but it has never been known that quinine has done the one or the other."

CINCHONA.

THE BARK OF C. FLAVA, C. RUBRA, C. PALLIDA.—SOUTH AMERICA.

THERAPEUTIC ACTION.—Cinchona is tonic, antiperiodic, corroborant, stimulant, astringent and antiseptic. It is justly placed at the head of the tonics. The profession generally regard it as one of the most important remedies in the materia medica. Since its first introduction into the list of therapeutic agents, it has lost none of the high reputation which it at first enjoyed. On the contrary, the same popularity and the high confidence then resposed in it as a permanent tonic and antiperiodic are now freely awarded to it. The Peruvian bark—its alkaloid principles—the *cinchonia* or *quinia*, or their salts—is more frequently resorted to as corroborants in cases of debility, and more especially in diseases of an intermittent character as antiperiodics, than any one or all others belonging to this class of remedial agents. The reason is obvious: no other article has so uniformly proved successful. It is the article upon which reliance has to a great extent been placed for two hundred years, during which time it has gained the confidence of physicians and secured a reputation in the treatment of diseases assuming periodicity which no other article now enjoys.

As a therapeutic agent, the cinchona is mostly employed in cases of debility, unattended with local irratation. "In such we find cinchona improves the appetite, promotes the digestive functions, and increases the strength of the pulse. The muscular system acquires more power, and the individual is capable of making greater exertion, both mental and bodily, than before; the tissues acquire more firmness to the touch, and lose their previous flabbiness; moreover, it has been asserted, and with great probability of truth, that the quality of the blood improves."

It often proves valuable in arresting profuse and debilitating night-sweats and other profuse discharges arising from debility, particularly in the convalescent stages of fever. It is also important in the advanced stages of continued fevers as a tonic, when there is great debility, provided no symptoms of celebral inflammation, or inflammation of the digestive or other vital organs be present.

The cinchona, or some of its preparations, is extensively used in the treatment of intermittent fever; and it rarely fails to arrest it, if judiciously administered. Some prescribe it not only during the intermission, but also throughout the whole period of excitement; and some premise with emetics and cathartics, while others usually omit all evacuants.

Although it may be employed in many cases during the pyrexial stage with advantage, yet we deem it most beneficial, as a general rule, during the period of apyrexia, especially if visceral congestion or local inflammation exist. If administered during the stage of excitement, the quantity necessary to moderate it is so great, that it proves irritating and oppressive to the stomach, and might increase the intensity of the fever, instead of diminishing it. The same objections are not obnoxious to the use of the sulphate of quinine, and consequently, if either is used, the salt is preferable.

QUINIÆ SULPHAS.

DOSE.—The dose of Sulphate of Quinine will vary according to the condition of the patient and the effect desired. For its stimulant and tonic action the dose will be from one-half to two grains; as an antiperiodic the quantity given during the intermission will be from ten to twenty grains. In proportioning the dose for children, it is well to add one grain for each year, starting with the quantity of one grain for a child one year old.

SPECIFIC INDICATIONS.—The indication for Quinine is *periodicity*, and the fevers take the form of remittent and intermittent. In some cases the periodicity is so marked that the observer can make no mistake, but in others it is very obscure, and practitioners to be successful need to be close observers.

Quinine will act kindly if the pulse is soft, the skin is soft, the tongue moist, and the nervous system moderately free from irritation. It does not act kindly when the pulse is frequent and hard, the skin dry, the tongue dry, and the nervous system excited.

These being facts, it becomes necessary, in many cases where quinine is indicated to prepare the patient for its use. This preparatory treatment lessens the frequency of the pulse, reduces the temperature, softens the skin, and relieves irritation of the nervous system. Now the remedy acts kindly and is curative, where it would have caused unpleasant excitement, and probably increased the disease.

THERAPEUTIC ACTION.—Sulphate of quinine is tonic and antiperiodic when administered in medicinal doses, and posesses the properties of the cinchona. In large doses it has been observed to occasion severe headache, vertigo, deafness, tinnitus aurium, diminution or loss of sight, dilated or contracted pupils, loss of speech, general trembling, intoxication or delirium, coma and great prostration. These unpleasant effects, following the too free use of the agent, arise, probably, from the exhaustion consequent upon the undue excitement occasioned by the over-dose of the medicine.

The rule we act upon in its administration is this: *Whenever an acute disease exhibits periodicity, we administer the agent during the intermission, or when there is the least excitement of the circulation; but if this can not be done, owing to the shortness of the intermission, we give it during the reaction.* We have practised upon this plan sufficiently long, we think, to have discovered any injury that might result, but have never seen any. Thus in bilious remittent fever, when the remissions are but half an hour or an hour, there not being sufficient time for the administration of the necessary amount of the remedy, we continue it during the exacerbation, and we have almost invariably found that, instead of increasing the fever, it shortens its duration, the next remission being longer and more complete. In fevers, however, in which there is no symptom of periodicity, we never employ it except as a tonic to prevent prostration.

In the advanced stages of continued fever, when there is great prostration of the vital powers, the importance of this agent is not to be overlooked. In all adynamic fevers and diseases characterized by atony and debility, in cachexia of a scrofulous character, in mercurial and syphilitic cachexia, when the vital energies are greatly impaired, in cases of gangrene or mortification, in passive hemorrhages and profuse mucous discharges, in short, in all cases requiring an energetic and sustaining course of medication, the sulphate of quinine will be found an important agent.

We find, sometimes, that owing to the irritability of the stomach, or repugnance to the taste of this agent, it can not be administered, at least in sufficient quantity to effect the desired result. In such cases we employ it endermically, directing one drachm to be rubbed up with two drachms of lard, and freely rubbed into the axilla, groin, and if necessary the inside of the thighs. We have been enabled, in many cases to control an intermittent or remittent fever in this way, when all other means had failed; it is particularly applicable to females of a debilitated and nervous habit, and in treating periodic diseases of children. Quinine has also been employed with success as an enema; to an ounce of starch add twenty grains of quinine and thirty drops of laudanum; it should be used three or four hours previous to the expected recurrence of the paroxysm.

CINCHONIÆ SULPHAS.

DOSE.—From gr. v. to gr. x.; three doses, taken during an intermission in intermittent fever, being generally sufficient to prevent the accession of the next paroxysm.

THERAPEUTIC ACTION.—Sulphate of cinchonia possesses most of the properties of the sulphate of quinine, but in a milder degree. We have employed it as an antiperiodic with good results, especially in those cases in which, owing to the idiosyncrasy of the patient, quinine could not be taken. It will be found a much pleasanter agent to the taste than quinine, which is a great desideratum; again, we think it is not so apt to produce irritation of the stomach, or cerebral symptoms; and lastly, it is sold for about one-half the price, which is no unimportant matter to the country physician who furnishes his own medicine. It may be employed in all cases where the sulphate of quinine is indicated.

CINCHONIDIÆ SULPHAS.

In the earlier manufacture of quinine this alkaloid with others was thrown away in the mother liquor. Afterwards this liquor was evaporated to an extract and held in stock until large quantities had accumulated, when it was found profitable to work it over and remove the alkaloids. Thus when the agent under consideration was introduced there was a large stock, and it was sold at a very low price.

DOSE.—The dose will range from one to five grains, the antiperiodic quantity being fifteen to twenty grains.

THERAPEUTIC ACTION.—In almost every respect this salt is similar to sulphate of quinine. It has the same tonic and antiperiodic properties, but is probably not quite so active. It has been claimed that it is not so apt to produce head symptoms, and that it is more kindly received by the stomach. It is not so bitter, and some persons take it more easily. As to its certainty, there is a difference of opinion. Whilst some claim that it is less certain, others think there is a greater degree of certainty.

It is to be recommended in place of quinine only when the difference in price makes it an object, and then it may be used for the same purposes, and in the same doses.

ALSTONIA.

THE BARK OF ALSTONIA CONSTRICTA.—AUSTRALIA.

PREPARATIONS.—The finely powdered bark. Tincture of Alstonia. Alstonine.

DOSE.—The dose of the powdered bark will be from grs. j. to grs. v. Of the tincture, from gtt. ij. to gtt. x. Of the alkaloid, grs. ⅛, to grs. ¼.

SPECIFIC INDICATIONS.—The disease shows distinct periodicity. The tongue is dirty, the skin is sallow and dirty, the urine is turbid.

THERAPEUTIC ACTION.—The antiperiodic action of Alstonia is more marked than any other agent which has been employed as a substitute for quinine. It is a powerful remedy, and where it is adapted to the case, three or four doses (two grains each) of the bark, will arrest an ague. It does not meet the indication—periodicity—in as large a number of cases as quinine, but where the tongue is dirty and the skin dirty, it will be found very certain. As it cures cases of chronic ague that quinine will not reach, the practitioner will be able to study his cases well.

The bark of the Alstonia constricta, or Australian fever tree, has been known as a pharmaceutical curiosity—at least, since 1863, when Palm separated from it a bitter principle which he called Alstonine. Dr. Hesse, director of the alkaloid works of Fr. Jobst, at Feurbach, near Stuttgart, has done much within the past few years to clear up the chemical history of the bark. A *precis* of his recently published results may be found in the medical journals. His researches leave some points undetermined, and the more practical question of the therapeutical effects of the bark and its alkaloids has hardly been approached. Dr. Bancroft has long used the bark in the hospitals of Melbourne with admirable success in cases of fever. Indeed, its vernacular name shows that the settlers discovered its healing properties before the doctors troubled themselves about it. But this seems to be a drug which will occupy no subordinate place as a mere cinchona substitute.

Dr. Hesse says: "Besides, allow me to add that I doubt the efficacy of Alstonine as a harmless remedy for fever, but that, on the contrary, I hold it to be a strong poison akin to strychnine. The Alstonia constricta bark contains about 2½ per cent. of this alkaloid, whilst it only yields 0.05 per cent. of Alstonidin. Thus you will see it will be difficult to manufacture them. The Alstonidin might have no practical importance, whereas this alkaloid (Alstonine) possesses very eminent therapeutic properties."

Dr. Bixby has used the drug largely during eighteen months, and has prescribed it in hundreds of cases. He finds its action resembles in many respects the combined action of quinine and nux vomica. It is an antiperiodic of the highest type, better, in his opinion, than the quinine or cinchonidine. It is a cerebro-spinal stimulant and tonic, acts positively upon the great sympathetic nerve-centers, and consequently increases, positively and permanently, the vital forces of the entire system. A proper sedative should be given before the use of this bark is begun.

In general nervous depression it acts like a charm; in typhoid, puerperal and other fevers, in recent colds and rheumatism, it has produced good results.

HYDRASTIS.

THE ROOT OF HYDRASTIS CANADENSIS.—U. S.

Preparations.—Powdered Hydrastis. Tincture of Hydrastis. Hydrastine.

Dose.—Of the powder, grs. ij. to grs. x. Of the tincture, gtt. j. to gtt. x. Hydrastine, gr. ⅛ to gr. ½.

Therapeutic Action.—The Hydrastis is tonic, stomachic, detergent, and laxative. It is an agent extensively employed by Eclectics, and with the greatest advantage. It seems passing strange that our Allopathic brethren have not yet their eyes open to its importance, as we believe that for the fulfilling of some indications it has no substitute.

It is a very mild, certain and permanent tonic. None with which we are acquainted exert a more decided and congenial tonic influence upon the stomach and digestive organs. In anorexia, indigestion, and general debility, arising from a languid or atonic state of the stomach, it is unsurpassed, restoring tone to the stomach, promoting the appetite, and acting as a general restorative. It may also be employed in those cases of chronic gastritis and chronic irritation of the stomach with altered secretion, which constitute the worst and most persistent forms of dyspepsia.

As a topical remedy in all diseases of mucous membranes, except acute inflammation, we believe it has no equal, as it rarely, if ever, produces irritation; but, on the contrary, it appears to quiet excitement and restore normal tonicity to the diseased parts.

The alkaloid itself is more soluble than its salts, but the sulphate is soluble in the proportion of four grains to the ounce of water; the phosphate, ten grains to the ounce.

Hydrastine possesses most of the tonic properties of the crude article, and may be used for the same purposes. As the dose is small and it is very soluble, it is easily dispensed. Five grains added to a glass of water makes an admirable tonic mixture, and may be given in doses of a teaspoonful to a tablespoonful.

We combine it with Podophyllin, giving both in small doses. One-twentieth grain of Podophyllin, and one-fourth grain of Hydrastine, make an admirable stimulant and tonic to the stomach and intestinal canal.

But it is principally as a topical remedy that we use Hydrastine and its salts. It makes an admirable collyrium in the proprotion of grs. j. to grs. iv. to water ℥j., when there is muco-purulent secretion. It is an admirable injection in the second stage of gonorrhæa in the proportion of grs. ij. to grs. x., to water ℥j. It may be used in some cases of sore throat, in chronic catarrh, and in leucorrhœa.

HYDRASTINE.

Hydrastine is a brilliant yellow principle, obtained from the Hydrastis Canadensis; it forms in delicate acicular crystals. It is inodorous, and possesses rather a pleasant bitter tase. It is freely soluble in cold water, but insoluble in alcohol or ether.

SALIX.

THE BARK OF SALIX ALBA.

PREPARATION.—Tincture of Salix.

DOSE.—From five drops to one drachm.

THERAPEUTIC ACTION.—The Willow bark is tonic, stomachic, antiperiodic, astringent, and antiseptic. It possesses very energetic tonic properties, associated with astringency. It has been resorted to as a substitute for Cinchona in the treatment of intermittents—its action upon the system being similar but feebler, and like that of Cornus florida. It has been exhibited with advantage in dyspeptic affections, when accompanied with or dependent on debility of the digestive organs.

SALICINE.

DOSE.—As a tonic in general debility, one or two grains four or five times daily; as an antiperiodic, five to ten grains five or six times daily; or from forty to sixty during the intermission, to be given in substance.

THERAPEUTIC ACTION.—Salicine is tonic and antiperiodic. Much discrepancy of opinion obtains among medical men relative to the efficacy of Salicin or Salicine in diseases of periodicity. While some have regarded it not only as equal but superior to the sulphate of quinine as an antiperiodic, others have ascribed to it but feeble antiperiodic powers. There can be no doubt that it is possessed of valuable tonic properties, and as such may be prescribed in cases of general debility, in dyspepsia, intermittents, remittents, and in rheumatism showing evidences of periodicity. It has been claimed to exert the same influence over rheumatism as salicylic acid, and in some cases to be better.

CORNUS.

THE BARK OF THE ROOT OF CORNUS FLORIDA.—U. S.

Preparation.—Tincture of Cornus Florida.

Dose.—From five drops to one drachm.

Therapeutic Action.—Cornus Florida is tonic, corroborant, astringent, antiseptic, and stimulant. It resembles the cinchona in its medical properties and uses, and may be employed as a substitute in the various cases in which that is recommended.

When administered it is found to augment the force and frequency of the pulse, and elevate the temperature of the body. It has been employed in intermittent fever as an antiperiodic; but since the introduction of the sulphate of quinine into general use, it has fallen into disuse. It is more frequently prescribed in atonic habits, when there is a relaxed or enfeebled state of the system, than for any other purpose.

It is sometimes used as a stomachic bitter in dyspepsia, and as a prophylactic to fevers.

In cases of gangrene and mortification, it is occasionally used, both internally and externally. The finely pulverized bark may be applied as a poultice to gangrenous ulcers, or to parts approaching gangrene.

PRUNUS.

THE BARK OF PRUNUS VIRGINIANA.—U. S.

Preparations.—Tincture Prunus. Syrup Prunus Virg.

Dose.—Of either, the dose will be from gtt. v. to ʒj.

Therapeutic Action.—The Prunus Virginiana is tonic, astringent and sedative.

The bark of the wild cherry is regarded as one of our most valuable indigenous remedial agents. It is a mild, unirritating aromatic tonic, and very acceptable to the stomach. Its first impression seems to be that of an excitant, agreeably to the testimony of Drs. Morris and Eberle, but it is not generally supposed to be possessed of excitant properties. It is a mild and valuable tonic, used with advantage in cases of dyspepsia; especially when connected with an irritable state of the stomach, or when attended with general irritability of the nervous system, over which it exerts a manifestly sedative influence. It is well suited to the debility which follows many inflammatory diseases, in which cases it is admissible at an earlier period than the more stimulating and energetic tonics. It has been employed very successfully, as a tonic, in the treatment of intermittent fevers, but is inferior to the cinchona.

COLUMBA.

THE ROOT OF COCCULUS PALMATUS.—AFRICA.

Preparation—Tincture of Columba.

Dose.—From gtt. v. to ʒss.

Therapeutic Action.—The Columba is tonic, stomachic and demulcent, says Pereira, and somewhat aromatic. It is one of our most valuable tonics and stomachics.

It is valuable in cases of enfeebled states of the stomach, attended with want of appetite, indigestion and general debility; no tonic is more appropriate in such cases; and none less apt to disagree with the stomach. In acid indigestion it may be united with bicarbonate of soda, or bicarbonate of potash.

FRASERA.

THE ROOT OF FRASERA CAROLINENSIS.—U. S.

Preparation.—Tincture of Frasera.

Dose.—From gtt. v. to ʒss.

Therapeutic Action—American Columbo is tonic, laxative, antiseptic and febrifuge, when properly dried; emetic and cathartic, in its recent state. It is a mild, pure, simple bitter, and a very valuable tonic, and may be prescribed in all cases where a simple, pure tonic is indicated. Many think it fully equal to the imported columbo, as a tonic, and it is extensively used in the Western States as a substitute for that article; while others regard it as far inferior to it as a remedial agent in the various cases in which that is employed.

HEPATICA.

THE PLANT OF HEPATICA AMERICANA.—U. S.

Preparation.—Tincture of Hepatica.

Dose.—From five drops to one drachm.

Therapeutic Action.—The Hepatica or Liverwort is said to be tonic, astringent, demulcent, pectoral and deobstruent.

The several species of this plant are not very active remedial agents, notwithstanding the high reputation which they at one time enjoyed. It is feebly tonic, slightly astringent, and somewhat demulcent and pectoral. Its employment has been, to a great extent, empirical; and the high praises bestowed upon it by many botanical physicians, it is believed, are to be received with caution and much allowance.

POPULUS.

THE BARK OF POPULUS TREMULOIDES.

Preparation.—Tincture of Populus.

Dose.—From five drops to one drachm.

Therapeutic Action.—The bark of the White Poplar is tonic, stomachic, febrifuge and alterative. It is a mild and not an unpleasant bitter, very well adapted to cases of general debility, emaciation, dyspepsia, attended with torpor of the liver or an unhealthy biliary secretion. It has been used as a tonic and febrifuge in intermittents with decided advantage. This, as well as other species of the Populus, is possessed of properties quite similar to the willow; indeed, its tonic qualities are, probably, dependent on its salicin. It has been exhibited advantageously as an alterative, associated with other alterants, as the burdock, yellow-dock, and yellow parilla, when tonics and alteratives are indicated.

POPULUS BALSAMIFERA.

Preparation.—Tincture of Populus Bals.

Dose.—From five drops to half a drachm.

Therapeutic Action.—The buds of the Populus balsamifera (commonly called the "*Balm of Gilead Buds*") are frequently employed as a tonic, gentle excitant, and pectoral agent. They yield a rich balsamic gum, upon which their virtues are dependent.

This remedy is exhibited in colds, coughs, chronic bronchitis, in all chronic bronchial affections, pain in the thorax, hemoptysis, and even in phthisis they have occasionally done good by relieving pain in the chest, lessening irritation and cough, and in promoting expectoration when it was performed with difficulty, owing to weakness in the respiratory organs.

PRINOS.

THE BARK AND BERRIES OF PRINOS VERTICILLATUS.—U. S.

Preparation.—Tincture of Prinos.

Dose.—From five drops to half a drachm.

Therapeutic Action.—The Black Alder is tonic, alterative, astringent, antiseptic, and anthelmintic. It is highly valued by many for its medicinal virtues. The bark has been employed in intermittents as a substitute for cinchona, but its febrifuge powers are feeble. The berries have been used with some advantage in intermittents. For this purpose one pint of the berries may be macerated in half a pint of proof spirits and half a pint of water until the strength is extracted, when the juice is to be expressed and sweetened. The dose is half a wineglassful every two hours between the paroxysms.

It is sometimes exhibited as an astringent and tonic in chronic diarrhœa, chronic dysentery, and whenever there is relaxation of the intestinal exhalants. It is more frequently employed as an alterative and antiherpetic agent in cutaneous diseases, and in various cachectic habits of body.

COPTIS.

THE ROOT OF COPTIS TRIFOLIA.—U. S.

Preparations.—The Powder. Tincture of Coptis.

Dose.—Of the powder, grs. ij. to grs. x. Of the Tincture, gtt. v. to ʒss.

Therapeutic Action.—The Coptis acts as a tonic and stomachic. It is a mild, simple, and pure bitter, closely resembling Hydrastis, Columbo, Quassia, Gentian, etc., in its medicinal properties; and it may be used as a substitute for these medicines when they are not at command. It is a valuable tonic and stomachic in dyspepsia. In cases of anorexia, but few if any articles will be found superior to this in promoting the appetite; and but few to exceed it, when the digestive functions are enfeebled, in facilitating their restoration to a normal standard.

SIMARUBA.

BARK OF THE ROOT OF SIMARUBA AMARA.—SOUTH AMERICA.

DOSE.—From five grains to half a drachm.

THERAPEUTIC ACTION.—The Simaruba is said to be tonic, emetic, stomachic, cathartic, diaphoretic, and diuretic. It is tonic and stomachic when given in small doses, but in large doses it causes vomiting and purging, and is said to promote diaphoresis and diuresis. It is not used, however, to fulfill any indication except those of a tonic and stomachic.

QUASSIA.

THE WOOD OF PICRÆNA EXCELSA.

PREPARATIONS.—Infusion of Quassia. Tincture of Quassia.

DOSE.—Of the infusion, from ʒj. to ℥j. Of the tincture, gtt. v. to ʒss.

THERAPEUTIC ACTION.—Quassia is tonic, stomachic and antiseptic, possessing all the properties that belong to the other pure bitters. It is employed in cases of anorexia for promoting the appetite and assisting the digestive functions. It is wholly devoid of all irritant, stimulant, or astringent properties, and hence has been regarded as the type of the pure bitters. Its use is mostly confined to atonic states of the system, with indigestion and loss of appetite.

CUSPARIA.

THE BARK OF GALIPEA CUSPARIA.—SOUTH AMERICA.

PREPARATION.—Tincture of Cusparia.

DOSE.—From five drops to half a drachm.

THERAPEUTIC ACTION.—Angustura Bark is tonic, stimulant, aromatic, emetic, cathartic, diaphoretic and diuretic.

It may be used in all cases where an aromatic bitter and tonic is indicated. It has been recommended in the malignant forms of intermittents and remittents of tropical climates. It has proved very efficacious in the treatment of those diseases, if we may believe the testimony of many writers of respectability.

It has also been administered to check profuse mucous discharges, such as occur in the latter stages and chronic forms of dysentery and diarrhœa, and chronic bronchial affections.

ANTHEMIS.

THE FLOWERS OF ANTHEMIS NOBILIS.—EUROPE.

PREPARATION.—Tincture of Anthemis.

DOSE.—From five to twenty drops.

THERAPEUTIC ACTION.—Chamomile flowers are tonic, stomachic, corroborant, aromatic, diaphoretic, emetic, antispasmodic and carminative.

They possess valuable remedial virtues. As an aromatic tonic, stomachic and corroborant, we know of no single agent that is superior. They are valuable in enfeebled states of the digestive organs, occurring either as a primary disease, or dependent upon some acute affection. In many cases of indigestion, unattended with gastric inflammation, they are found to be very acceptable and curative.

ANTHEMIS COTULA.

THE FLOWERS OF ANTHEMIS COTULA.—U. S.

DOSE.—Cold infusion, ℥j. to ℥ij., as a tonic; as a diaphoretic, the warm infusion is given in doses of from ℥ij. to ℥iv.

THERAPEUTIC ACTION.—May-weed is tonic, stomachic, sudorific, emetic, anodyne, discutient, revulsive and emmenagogue, being possessed of many properties in common with the preceding variety. In small doses it invigorates the digestive organs and improves the general tone of the system. To fulfill this indication it should be used in the form of a cold infusion. The warm infusion, taken freely, is very useful for promoting perspiration.

CHAMOMILLA.

THE FLOWERS OF MATRICARIA CHAMOMILLA.—EUROPE.

PREPARATIONS.— Infusion of Chamomile. Tincture of Chamomile.

DOSE.—Of the infusion, half an ounce; of the tincture, from the fraction of a drop to half a drachm.

THERAPEUTIC ACTION.—German Chamomile is a tonic, stomachic, diaphoretic, emetic, antispasmodic and anthelmintic, being very analagous to the anthemis nobilis in its medical and physical properties. It is mildly tonic, and very useful in debilitated states of the digestive organs, when a stomachic and corroborant are indicated.

The warm infusion answers a very good purpose as a diaphoretic in colds, and also in the incipient stages of febrile and inflammatory attacks. For this purpose it should be administered freely.

Our Homœopathic neighbors claim that it relieves irritation of the intestinal canal, and employ it in cholera infantum and in diarrhœa. My experience does not sustain this claim.

CASCARILLA.

THE BARK OF CROTON CASCARILLA.—WEST INDIES.

PREPARATION.—Tincture of Cascarilla.

DOSE.—From five drops to one drachm.

THERAPEUTIC ACTION.—The Cascarilla bark is tonic, stomachic, stimulant, aromatic and diaphoretic. It was at one time extensively employed in Europe as a febrifuge in intermittent and remittent fevers, in the place of cinchona, and by some regarded as superior to that article. Its aromatic and stimulant properties, which it possesses in a high degree, render it much more acceptable to the stomach.

In large doses it acts as a general excitant as well as tonic, causing an acceleration of the pulse, increased heat of the body and diaphoresis. It may be used with advantage in atonic states of the stomach attended with flatulency.

MAGNOLIA.

THE BARK OF MAGNOLIA ACUMINATA.—U. S.

PREPARATION.—Tincture of Magnolia.

DOSE.—From five drops to one drachm.

THERAPEUTIC ACTION.—Magnolia is a stimulant tonic, possessed of aromatic and diaphoretic properties, and has been employed in intermittents and remittents with advantage. If taken freely between the paroxysms, it has been found capable of arresting them. In torpid and phlegmatic habits of body, where a stimulant is desirable, this may answer a very good purpose, but it can not be relied on as a substitute for the cinchona.

ALETRIS.

THE ROOT OF ALETRIS FARINOSA.—U. S.

PREPARATION.—Tincture of Aletris.

DOSE.—From five drops to half a drachm.

THERAPEUTIC ACTION.—The Aletris is tonic, stomachic, narcotic, discutient, emetic, cathartic, and expectorant. In small doses it is tonic and stomachic. In large doses it is said to produce nausea, vomiting, purging, dizziness and other unpleasant effects, which would seem to indicate that it is possessed of acro-narcotic properties.

Small doses promote the appetite and assist digestion. It is similar to quassia in its properties, so far as a tonic and stomachic are concerned. It is used in cases of flatulency, colic, hysteria, and chronic rheumatism.

Aletris is recommended in diseases peculiar to females as an article of great value. In cases of frequent abortions, or where a disposition to abort exists, in nervous weakness, pain in the breast or side, cold, coughs, consumption, and uterine derangements in general, it has been recommended as a highly important agent.

EUPATORIUM.

THE PLANT EUPATORIUM PERFOLIATUM.—U. S.

PREPARATION.—Tincture of Eupatorium.

DOSE.—From the fraction of a drop to half a drachm.

THERAPEUTIC ACTION.—Eupatorium is tonic, diaphoretic, emetic, aperient, and expectorant. It may be so administered as to fulfill a variety of important indications in the treatment of disease, according to the dose and mode of administration; for this reason it is somewhat difficult to say which of its properties is most prominent, and under what class of agents it should be described. Believing it to be more frequently used as a tonic, we shall attach it to that class of agents. -

Eupatorium is a mild, simple, valuable bitter, and may be employed in all cases where the simple tonics are indicated. Administered alone, or associated with other tonics, aromatics, or stimulants, it answers a valuable purpose in the convalescent forms of acute diseases. The same may be said of it in dyspepsia, and almost all chronic diseases; as a general tonic, exhibited in the form of powder or small doses of a cold infusion, it answers an admirable purpose.

HELONIAS.

THE ROOT OF HELONIAS DIOICA.—U. S.

Preparation.—Tincture of Helonias.

Dose.—From one drop to half a drachm.

Therapeutic Action.—Helonias is tonic, stomachic, diaphoretic, and pectoral. It is used by many botanic physicians with decided advantage. It is adapted to atonic states of the system. It causes an improvement of the appetite, and promotes digestion. It is said to have been employed for the purpose of preventing abortions, for which it enjoys a high reputation.

It has been recommended in cases of chronic rheumatism, jaundice, strangury, etc.; also in colds, coughs, pectoral affections, and consumptive diseases, as a diaphoretic and expectorant.

GENTIANA.

THE ROOT OF GENTIANA LUTEA.—Europe.

Preparation.—Tincture of Gentian.

Dose.—From five drops to half a drachm.

Therapeutic Action.—Gentian is tonic, stomachic, slightly stimulant and feebly laxative. The latter properties are so feeble as to rarely receive any especial notice. It possesses all the tonic and stomachic powers of the simple bitters in a high degree, and is remarkably well adapted to all states of the system requiring their use It proves most valuable in cases of a phlegmatic and torpid character, but is contra-indicated in febrile diseases; nor is it adapted to cases of irritation or inflammation of the gastro-intestinal mucous membrane. It is, however, very extensively employed, and is to be regarded as an efficient tonic.

GENTIANA OCHROLEUCA.

Dose.—Of the powder, from grs. x. to ʒss.; of the tincture, the same doses as the preceding variety.

Therapeutic Action.—This variety of Gentian is described as tonic, aperient and antiperiodic. It is deemed of much importance by those who have used it, as a tonic and stomachic in debilitated conditions of the stomach and bowels.

It is said to be useful in counteracting the formation of acid in the alimentary canal, and its capacity for imparting tone to the digestive organs adds to the probability of the statement. It has been employed with advantage in intermittent fever, and as an emmenagogue.

GENTIANA CATESBÆI.

THE ROOT.

Preparation.—Tincture of Gentiana Catesbæi.

Dose.—From five drops to half a drachm.

Therapeutic Action.—This species of Gentian is tonic, stomachic and diaphoretic; it is much used in some portions of the Southern States, and is said to be scarcely inferior to the imported article. It is a pure bitter, and as such may be substituted for other agents of this class. It is employed in dyspepsia and debilitated states of the system, arising from indigestion.

LIRIODENDRON.

THE BARK OF LIRIODENDRON TULIPIFERA.—U. S.

Preparation.—Tincture of Liriodendron.

Dose.—From five drops to one drachm.

Therapeutic Action.—The bark of the Tulip Tree is tonic, stimulant, diaphoretic, diuretic, anthelmintic, aromatic, stomachic. It may be used in all cases of anorexia and impaired states of the digestive organs, where a stimulant tonic is indicated. It promotes the appetite and facilitates digestion; for these purposes it will be found fully equal to the simple bitters. It is often used with some advantage in intermittents.

It is employed in gout and chronic rheumatism, and in the declining stages of the acute form, after the irritated action has subsided, as a stimulating diaphoretic and tonic. If administered freely in the form of a warm infusion, it evinces conspicuous diaphoretic properties; and not unfrequently its diuretic powers are equally manifest.

EUONYMUS.

THE BARK OF THE ROOT EUONYMUS ATROPURPUREUS.—U. S.

PREPARATION.—Tincture of Euonymus.

DOSE —From five drops to one drachm.

THERAPEUTIC ACTION.—The Euonymus is tonic, aperient, alterative, pectoral and antiperiodic. It is known to but few as a medicinal plant, and its properties are, as yet, we believe, but imperfectly known to any; nevertheless, we believe it is destined, at no distant period, to occupy a high place among our indigenous therapeutic agents.

From our own experience we believe it to be a valuable tonic and laxative. It imparts tone to the stomach, facilitates chylosis, and if there is a torpid state of the bowels, no better agent can be administered to promote their action without inducing their debility.

It would likewise seem, from the testimony of good authority, to be possessed of antiperiodic powers of no small importance.

MENISPERMUM.

THE ROOT OF MENISPERMUM CANADENSE.—U. S.

PREPARATION.—Tincture of Menispermum.

DOSE.—From five drops to one drachm.

THERAPEUTIC ACTION.—The Yellow Parilla is tonic, alterative, stomachic, laxative and diaphoretic; but like many other valuable indigenous medical agents, has received little attention from the profession.

It is said by some to be laxative, but its laxative properties are not very conspicuous. It is somewhat diaphoretic, though seldom if ever used to secure this influence alone. Associated with its tonic, are valuable alterative properties; and hence it is extolled by those most familiar with its curative powers, as having a very decided control over a great variety of chronic diseases of a cachectic character, requiring the use of alterative measures.

SABBATIA.

THE HERB OF SABBATIA ANGULARIS.—U. S.

Preparation.—Tincture of Sabbatia.

Dose.—From five drops to half a drachm.

Therapeutic Action.—The American Centaury is tonic, stomachic, anthelmintic and diaphoretic. It is possessed of the properties of the simple bitters, and as such is frequently used in dyspepsia, the convalescent forms of fever, and in all cases of general debility.

PINUS PENDULA.

THE BARK OF THE AMERICAN LARCH.—U. S.

Preparation.—Tincture of Pinus Pendula.

Dose.—From five drops to half a drachm.

Therapeutic Action.—Tamarac bark is tonic, diuretic and alterative. It has been employed in almost all chronic cachectic diseases, for its tonic and alterative properties, and is often of much service. In conjunction with other agents, it is used in dyspepsia, chronic hepatic diseases, passive dropsies, and during the convalescence of both acute and chronic diseases.

PTELEA.

THE BARK OF THE ROOT PTELEA TRIFOLIATA.

Preparation.—Tincture of Ptelea.

Dose.—From one drop to half a drachm.

Therapeutic Action.—The Ptelea is tonic, stimulant, expectorant, alterative, astringent and diaphoretic. Among its uses may be noted its influence in some cases of asthma, greatly relieving the patient, and sometimes accomplishing a cure.

It is a good tonic and stomachic, and as such may be used in debilitated states of the system, in dyspepsia, anorexia, intermittents, convalescent stages of other diseases, and, in short, whenever a corroborant is demanded. We have found the tincture beneficial in chronic rheumatism. Others have used it in the same disease with advantage. Its pungent, excitant, tonic, diaphoretic, and alterative properties would seem to point to it as a useful remedy, in the chronic forms of that disease, attended with debility and requiring excitants.

CHELONE.

THE LEAVES OF CHELONE GLABRA.—U. S.

PREPARATION.—Tincture of Chelone.

DOSE.—From five drops to half a drachm.

THERAPEUTIC ACTION.—The Chelone is tonic, stomachic, laxative, anthelmintic and hepatic. It is one of the mildest, purest and most congenial tonic and stomachic agents in the materia medica. It is unusually acceptable to the stomach, and is valuable in anorexia, languid or atonic states of the digestive organs, and promotes the appetite and facilitates the process of digestion. In cases of confirmed dyspepsia, especially if attended with torpidity of the bowels, it answers a good purpose, as it does in chronic diseases in general, attended with debility.

BERBERIS.

THE BARK AND BERRIES OF BERBERIS VULGARIS.—U. S.

PREPARATION.—Tincture of Berberis.

DOSE.—From five drops to one drachm.

THERAPEUTIC ACTION.—It is tonic, stomachic, laxative, antiseptic and astringent.

It is an energetic tonic, and although laxative, is at the same time astringent. It is useful in dyspepsia, especially when connected with a torpid state of the liver and constipation of the bowels; promotes digestion, and seems to increase the assimilating functions.

PANAX.

THE ROOT OF PANAX QUINQUEFOLIA.—U. S.

PREPARATION.—Tincture of Panax.

DOSE.—From one drop to half a drachm.

THERAPEUTIC ACTION.—Ginseng is feebly tonic, a pleasant stomachic and aromatic stimulant, a gentle nervine, slightly diaphoretic, and somewhat demulcent.

It promotes the appetite, facilitates digestion and invigorates the general system, and is considered beneficial in morbid states of the nervous system. Some are in the habit of employing it as a nervine and antispasmodic, either alone or associated with other agents belonging to that class, in cases of debility or irritability of the nervous system.

FRAXINUS.

The inner bark of the Fraxinus Acuminata, or White-Ash, is tonic and astringent in small doses; if taken freely, it is actively purgative. We think it decidedly alterative. It has been used as a tonic in intermittents, and also as an astringent in hemorrhages. We have used the White Ash bark with benefit in dyspepsia, general debility and cachectic habits, with a view to its tonic and sustaining powers, and for its aperient action.

FEL BOVINUM.

DOSE.— From grs. v. to grs. x. of the inspissated Gall, three or four times daily.

Ox-Gall was at one time regarded as a highly important and peculiarly valuable agent, in cases of dyspepsia attended with a deficient biliary secretion. It is supposed to give tone to the digestive organs, and facilitate the process of chymification and chylification. If the biliary secretion was scanty, vitiated, or in any respect devoid of its healthy solvent powers, and its due capacity to augment the peristaltic action of the bowels, the ox-gall at one time enjoyed a high reputation for correcting all such morbid states.

FERRUM.

IRON.

THERAPEUTIC ACTION.—The chalybeate or ferruginous preparations are found to be of much importance in certain states of the system. So far as its physiological effects are concerned, the Iron, so long as it retains its metallic form, is supposed to be inert, or at least to exert but a feeble influence upon the system. It is probable, however, that its mechanical action upon the bowels, when in a metallic state, may stimulate them to healthy action, give increased tone and vigor, and thus prove beneficial. It is also said to be useful in removing worms, which it is supposed to do mechanically. These effects are by no means its most important ones in a therapeutic and physiological point of view. When the metallic Iron is taken into the stomach it readily oxidizes, and thereby acquires its most prominent powers. Acids, acid wines and fruits, assist in giving activity to the metal, by promoting the chemical changes upon which its value as a remedial agent depends, and for the same reasons alkaloids and their carbonates are inadmissible, while the patient is using Iron. During its oxidization, hydrogen gas is evolved, giving rise to unpleasant eructations. By the internal use of this metal the stools are rendered black. Notwithstanding the changes which the Iron undergoes by oxidation in the system, yet it does not acquire poisonous qualities by these changes, like most other metals.

Most of the chalybeate preparations are possessed of astringency, in addition to their more prominent tonic and alterative properties. They diminish excessive secretions from the mucous membranes, as the gastro-intestinal, giving tone to the bowels, while at the same time they render the alvine discharges more consistent, and not unfrequently cause constipation. The sulphate and chloride of iron are more irritating than any other preparations of this metal, and are regarded even as poisonous; they are, however, very feeble poisons when compared with the mercurial and cupreous salts, and are likewise more decidedly astringent than any of the other ferruginous preparations.

By the use of chalybeates the blood becomes more florid, or acquires a scarlet color, owing to the increased number of its particles of coloring matter; and the crassamentum also gains in volume, as well as in firmness or density.

These physical and chemical alterations in the sanguiferous fluid render it more stimulating to the organs, and hence the improvement in their functions arising from the use of the iron. The salutary changes attending it are not speedy, but slow and gradual, owing to its very tardy absorption into the system.

Preparations of iron are contraindicated in cases of irritation or inflammation of the alimentary canal, likewise in plethoric habits, with a tendency to apoplexy and inflammatory affections. On the contrary, they are indicated when there is a soft lax state of the solids and muscular fiber, in feebleness or inertia of the organs, and in leucophlegmatic habits; in cases of anæmia and chlorosis they are indicated, and are of primary importance in effecting a cure.

FERRUM RAMENTA.

DOSE.—From five to twenty grains, in electuary.

The metallic iron, in the form of "filings," is inert in its uncombined state; at all events it exerts but a feeble influence upon the animal economy. Its sanative powers are attributable to the chemical changes which it undergoes in the system. By the union with an acid, or some other agent, in the system, the iron becomes oxidized, and thus acquires its activity as a therapeutic agent. There can be no doubt, however, that the metallic iron will prove useful in cases where there is torpor in the alimentary canal from want of tone and excitement, as in some forms of dyspepsia, and constipated and sluggish states of the bowels. It is also said to be anthelmintic, and is supposed to act mechanically upon the worm.

FERRI OXIDUM SQUAMÆ.

DOSE.—From five to twenty grains.

The Scales of the Oxide of Iron, found at the anvil of the blacksmith, are possessed of the general properties of the chalybeates. They are formed when iron is heated to redness, and consist of a mixture of monoxide and sesquioxide of iron in varying proportions. They are used in domestic practice in cases of amenorrhœa, chlorosis, etc., mixed in molasses or honey, or put into wine. They are considered unfit for use, however, until reduced to a fine powder, when they are united with other agents, forming the next preparation, *Ferri Oxidum Nigrum*, or Black Oxide of Iron.

FERRI OXIDUM NIGRUM.

DOSE.—Five to twenty grains, two or three times a day.

The Black Oxide of Iron is a chalybeate preparation long and extensively used. It is exhibited in the same cases as the other ferruginous preparations. It is tonic, and said to be useful in promoting the menstrual secretion, hence administered in chlorosis, anemia, and other cachectic states. Royle says, "It has the advantage of being a compound of the protoxide, which is usually considered the most efficacious."

FERRI CARBONAS.

SUB-CARBONATE OF IRON.

Dose.—From grs. v. to ʒij., as a tonic, alterative, and emmenagogue.

This preparation is not a true carbonate, but a ferric oxyhydrate. It is extensively employed, and is considered applicable to all cases in which the chalybeates are indicated.

Dr. Carmichael recommended it highly in cancerous diseases. Mr. Hutchinson reports many cases of neuralgia, especially facial neuralgia, in which it proved eminently beneficial; and Dr. Dunglison and many others fully corroborate these reports. In chlorotic affections, scrofulous diseases, general cachexia, amenorrhœa, chorea, epilepsy, dropsy, and many chronic diseases of long duration, especially when the blood becomes reduced in quantity, and impaired in quality, as in protracted intermittents, remittents and nervous diseases, great advantage has been derived from its exhibition. It is an antidote to arsenious acid, although not so effectual for this purpose as the hydrated oxide.

FERRI SULPHAS.

SULPHATE OF IRON.

Dose —From one to five grains in the form of a pill.

Therapeutic Action.—The Sulphate of Iron is tonic, astringent, emmenagogue and stimulant, possessing many properties in common with the other ferruginous preparations; consequently its remote effects upon the system correspond with those attending the employment of preparations already named. Its local action is that of a powerful astringent, and if given in a concentrated form, it acts as an irritant by virtue of its chemical action on the tissues.

It is employed topically, either in the form of a solution or powder, as a styptic, to arrest hemorrhages from bleeding surfaces. The solution is frequently applied to ulcerated surfaces and to mucous membranes, to lessen profuse discharges. In leucorrhœa, gonorrhœa, gleet, ophthalmia, etc., and as a gargle in ulcerated states of the mouth and fauces, it may be resorted to with advantage. The solution is also employed in various eruptive and herpetic affections as a wash, as in the case of herpes circinatus, poisoning from Rhus, etc. For this purpose from one to ten grains may be added to one ounce of water.

FERRI CARBONAS SACCHARATUS.

VALLETT'S FERRUGINOUS MASS.

DOSE.—From one to ten grains in the form of pills.

The Saccharine Carbonate of Iron is one of the most valuable ferruginous preparations. It is soluble in the fluids of the stomach, and hence is readily absorbed. It is especially valuable in chlorosis and anemia, where the indication is to increase the red corpuscles of the blood; but it may also be employed wherever a preparation of iron is indicated.

FERRI FERROCYANIDUM.

PRUSSIATE OF IRON.

DOSE.—From three to six grains.

Prussiate of Iron possesses the properties of the other preparations of iron, and in addition to these, it is regarded as a valuable antiperiodic. There can be no doubt but that it possesses this last property in a notable degree. Dr. Zollickoffer recommended it as a more certain, prompt, and efficacious remedy in intermittent and remittent fevers than the Peruvian bark. Though we can not go so far as that, we would be willing to state that, combined with quinine, it will add at least one-fourth more power to the agent. We employ it in preference to any other preparation of iron in chronic disease, when there is any tendency to periodicity.

FERRI OXIDUM HYDRATUM.

SESQUI-OXIDE OF IRON.

This preparation of iron is similar to the anhydrous sesquioxide, or precipitated carbonate, in its general properties, and may be exhibited with advantage in the same cases in which that was recommended. It is not used, however, to any considerable extent as a substitute for that and the other chalybeate preparations in general use.

Its antidotal powers to the arsenious acid, entitles it to our especial attention as a toxicological agent. It unites with the arsenious acid, forming an insoluble arseniate of iron, and hence prevents its corrosive effects upon the gastro-intestinal mucous membrane. Its efficacy, as an antidote to this poison, has been fully shown by experiments made upon animals, and also by the successful results which have attended its employment in cases of poisoning in the human subject.

Twelve parts of the oxide or hydrate, prepared by ammonia and administered in the form of a pulpy mass, by mixing with water, are required to neutralize or render inert one equivalent of the arsenic. The dose of the pulpy hydrate to an adult is one tablespoonful every five or ten minutes, and to children a dessertspoonful; repeat it until the urgent symptoms subside.

TINCTURA FERRI CHLORIDI.

DOSE.—From ten to thirty drops in water.

THERAPEUTIC ACTION.—The Tincture of Muriate of Iron is considered one of the most active, certain and valuable preparations of iron. It is decidedly tonic, and an energetic astringent and styptic, and if the dose is large it is an irritant poison, owing to the great amount of free hydrochloric acid contained. If taken in large doses, its action is to disorder the stomach.

In addition to the tonic and alterative properties of this agent, which, in common with other chalybeates, it possesses, it has astringent and diuretic properties in a high degree.

It is advantageously employed as a tonic and alterative in scrofula, rachitis, *tabes* arising from extensive ulceration or suppuration, and attended with hectic fever and night-sweats; in tabes mesenterica, tabes dorsalis, chlorosis, cachectic habits, in all cases of anæmia, in many chronic, and also in the convalescent forms of many acute diseases. In asthenic dropsies it is likewise useful, especially when it arises from loss of blood, or from amenorrhœa.

It seems to act specifically upon the genito-urinary organs, as it appears by the increased urinary secretion, and by its effects upon the kidneys, bladder, urethra, and prostate gland. In cases of leucorrhœa, chronic gonorrhœa, gleet, etc., it has been found beneficial. In dysuria, or retention of urine, arising from a spasmodic stricture of the urethra, Pereira recommends it. In this case the dose is ten drops every ten minutes until relief is obtained. The same writer has used it associated with the tincture of cantharides, in the latter stages of gonorrhœa, with advantage, after other remedies had failed. In passive hemorrhages from the kidneys, bladder or uterus, it is found valuable, and is likewise employed in chronic diarrhœa, dysentery and cholera infantum, attended with relaxation of the intestinal exhalants, in which cases its tonic and astringent powers have, in some instances, rendered it an exceedingly important remedy. For this purpose it may be given in small doses, associated with a few drops of the tincture of opium or paregoric.

One of the principal uses of this remedy is to antidote the poison of erysipelas, which it does in a very marked manner. In the olden time it was thought to be a true specific for the disease, but a further study has shown that erysipelas (like other named diseases), is not always the same. Many cases are met by this remedy, some by Rhus; others by Veratrum; and others still by sulphite of soda.

Tincture of Muriate of Iron is indicated by the deep color of the part, and by the deep red of the tongue. With these indications it can be administered in doses of gtt. v. to ʒss., every two or three hours, and a local application of the remedy pure or diluted with glycerine.

To one who has not studied the specific action of remedies, the action of this medicine will be a revelation. We are called to a patient who has erysipelas, and find a pulse of 120, small and hard, a temperature of 104°, a dry skin, scanty urine, constipated bowels, tongue dry, brown and fissured, nervous system excited, and inability to sleep. We administer the single remedy, tincture of muriate of iron; the pulse comes down to 90, temperature to 100°, the skin softens, the urine is increased in quantity, the tongue moistens and cleans, the nervous system is relieved, and the patient sleeps. All from one remedy, and a remedy that has not been recommended for these purposes.

FERRI IODIDUM.

IODIDE OF IRON.

Dose.—From three to ten grains.

Iodide of Iron is a valuable therapeutic agent, possessing both the properties of the iron and iodine; it is the mildest form in which the latter agent can be used. It is indicated as a tonic and alterative, in scrofulous or other cachectic affections, if there is much debility, with a soft and relaxed state of the muscular fiber, and an exsanguine appearance of the surface. It promotes the appetite, facilitates digestion, in some cases proves laxative and diuretic; at the same time, we obtain the resolvent and alterative influence of the iodine. We have employed it in secondary syphilis, where there was great prostration of the system, with decided advantage, and in such cases as these, would strongly recommend it

The best forms in which this agent can be administered, are the Syrup of Iodide of Iron in doses of ʒss.; or the Syrup of Iodide of Iron and Manganese, in doses of from ten drops to half a drachm.

FERRI ACETATIS.

Dose.—From ten drops to half a drachm.

Acetate of Iron is formed by dissolving the sesquioxide of iron in acetic acid. It is a deep red liquid, having an acid chalybeate taste. It possesses the properties of the other ferruginous preparations, and in addition, others, which render it valuable in certain conditions of the system. Thus in typhoid and typhus fever when the system becomes prostrated, it may be used to good advantage, the acetic acid being one of our best antiseptics. It is also a very valuable preparation of iron in the treatment of scorbutis, and especially valuable in those low cachectic states of the system, sometimes produced by secondary syphilis. In this last case we would especially recommend its trial.

FERRI PERNITRAS.

Dose.—From ten drops to one drachm.

The Pernitrate of Iron is obtained by dissolving iron in nitric acid; it forms a dark red solution, with a very astringent taste.

This preparation of iron was introduced by Mr. Kerr, who considers it a very powerful astringent and mild caustic. He thinks that in addition to an astringent quality, it possesses the property of diminishing the irritability and tenderness of the mucous membranes with which it may come in contact. The remote effects are hæmatinic and tonic, like other chalybeates. He introduced it as a valuable remedy for chronic diarrhœa both in children and adults, and whether accompanied with vomiting or not. With the exception of dysentery and the diarrhœa which succeeds typhus, he found it useful in almost every case of diarrhœa.

We employed it in a case of chronic diarrhœa, contracted in the South, of two years' standing, with entire success, after having failed with the usual remedies. We also use it as a local application in inflammation of the cervix uteri, and we think with marked benefit. It deserves further investigation.

FERRI ET POTASSII TARTRAS.

Dose.—From ten grains to half a drachm.

The Tartrate of Iron and Potash is a very eligible preparation of iron, in consequence of its slight taste and ready solubility. Its agreeable taste and the facility with which it may be administered, render it a convenient and appropriate remedy in diseases of childhood. In its general action upon the system it corresponds with most of the chalybeates, but is less astringent than some. It is also said to be milder in its action on the vascular system.

FERRI PHOSPHAS.

PHOSPHATE OF IRON

Dose.—From five to ten grains.

The Blue Phosphate of Iron, though one of the sparingly soluble preparations of iron is possessed of many of the properties of that agent. A perfectly soluble scaled phosphate of iron is now made by a process similar to that used in making the citrate of iron, and this is officinal in the Pharmacopœia. It is preferred by some to all other preparations in those cases of nervous irritability, complicated chlorosis, with anæmia, and other diseases, where there is general debility of the system.

FERRI CITRAS.

Dose.—From two to ten grains.

Citrate of Iron is one of the best ferruginous preparations, and may be employed in all cases where iron is indicated. This and the acetate before mentioned we consider preferable to any where there is a cachectic condition of the system, as in scrofula, scorbutis and secondary syphilis. It may also be employed with very good effect in chlorosis, especially in those cases where there is a fetor of the breath and a constant yellow coat upon the tongue, with pale, spongy gums.

ACIDUM PHOSPHORICUM DILUTUM.

Dose.—From gtt. x. to f℥ss., properly diluted.

Therapeutic Action.—" Phosphoric Acid possesses the tonic properties of sulphuric acid, and is preferable to it in point of flavor. It has also been used with advantage to correct those morbid states of the system in which a tendency exists to unusual depositions of phosphate of lime, such as in cases of exostosis or formation of bony tumors, as well as in some forms of urinary concretion. It may be employed for a longer period without disturbing the digestive functions than most agents of this class."—*Phillips.*

Dr. Paris states that he has found it to assuage the thirst so commonly present in diabetes more effectually than any other acid drink. Hecker says it exerts a special influence over the nervous system, by virtue of which it possesses the power of allaying pain and spasm. Sundelin regards it as a stimulant and tonic to the sexual organs.

We have employed it with apparent advantage in some cases of phthisis pulmonalis, where there was marked excitability of the nervous system. We also consider it an excellent agent in severe cases of spermatorrhœa, and impotency arising from this and other causes. In those severe but obscure affections of the nervous system characterized by palpitation of the heart, irregular circulation of the blood, sense of fullness and constriction of the thorax, with want of command over the voluntary muscles, it has proved one of our most efficient agents.

PHOSPHORUS.

Preparations.—We employ Phosphorus in substance in the form of pills. Tincture of Phosphorus.

Dose.—Of Phosphorus, from gr. 1-50 to gr. 1-100. Of the tincture, we usually add gtt. x. to gtt. xx., to water ℥iv.; give in teaspoonful doses.

Therapeutic Action.—Phosphorus is thought to be a stimulant and tonic to the nervous system, exerting a special influence upon the reproductive organs. In some cases it exerts a beneficial influence, and patients improve in appetite and digestion, and many nervous symptoms are relieved. I am not satisfied as to its aphrodisiac power, and would prefer to trust other remedies when this function needs to be strengthened.

Tincture of Phosphorus exerts a special influence upon the bladder, prostate, vesiculæ seminales and testes, relieving irritation and improving the innervation and circulation. I use it in chronic cystitis, chronic prostatis, enlarged and pendulous testes, gleet, chronic ovaritis and vaginitis.

It may also be prescribed for pneumonia, stage of hepatization, when pus appears in the sputa, or when absorption of the effusion is slow. In these cases the pulse is feeble, the tongue pasty, and digestion poor.

HYPOPHOSPHITE OF LIME.

Dose.—From one to five grains.

Therapeutic Action.—The Hypophosphites belong to the class of *Restoratives*—agents which add to the body a material that is deficient, and they are useful when the disease depends on the want of such materials in the blood. "The importance of the element, phosphorus, in the human economy, has not been appreciated until quite a recent period. The amount present in the brain, as shown by investigations at the Cambridge laboratory a few years since, is much larger than was supposed. Not only had the best chemists of Europe fallen into error in their estimates of the quantity of phosphorus, but also in that of sulphur, the element so closely allied to phosphorus in its uses and chemical affinities. The vital importance of these agents in maintaining a normal condition of the system can be understood by a consideration of the probable fact that in all the operations of the mind, every effort requiring an expenditure of nervous force, they are called into action."—*Nichols.*

We frequently find cases in practice in which there is undoubtedly great depression of the nervous power, in fact, want of innervation: cases of chronic disease in which this depression of nervous force appears to be the paramount disease—at least, the hardest to treat. It is in such cases that we have obtained the most benefit from the administration of the hypophosphite of lime. We do not, however, look for immediate benefit. The agent has to be appropriated by the system, and it may be days or even weeks before its influence is apparent, but we have never been disappointed in its effects at last.

In the early stages of phthisis pulmonalis, we know of no agent capable of producing such marked beneficial influence upon the disease. Why it increases the strength of the patient and the tone of the digestive organs, relieves cough and oppressed respiration, etc., we are unable to say, but of the fact we are confident.

HYPOPHOSPHITE OF SODA.

DOSE.—From five to ten grains.

The action of Hypophosphite of Soda is similar to the hypophosphite of lime. It should be selected when the tongue is broad and pallid, and there is an evident want of soda.

HYPOPHOSPHITE OF POTASSA.

DOSE.—From five to fifteen grains, three or four times a day.

THERAPEUTIC ACTION.—Hypophosphite of potassa possesses similar properties to the other hypophosphites. In some conditions of the system, where potash is indicated, it will prove the best preparation.

HYPOPHOSPHITE OF AMMONIA.

Dose—From five to fifteen grains, three times a day.

Therapeutic Action.—Hypophosphite of Ammonia possesses properties similar to the other hypophosphites, with the additional action of the salt of Ammonia. The indications for its preference will be apparent to the practitioner.

HYPOPHOSPHITE OF SESQUIOXIDE OF IRON.

This salt is a white, amorphous tasteless powder, like the pyrophosphate, soluble in hydrochloric acid, and in free hypophosphorous acid. We are not aware that it has been employed in medicine, except as an ingredient of the compound syrup of hypophosphites.

HYPOPHOSPHOROUS ACID.

Dose.—From ten drops to one drachm. A teaspoonful contains two grains and a quarter of phosphorus.

We employ this preparation when there is an evident want of an acid as well as phosphorus. With a deep red tongue it sometime proves even beneficial as a restorative.

Compound Syrup of Hypophosphites.—This syrup is supposed to possess the combined properties of the hypophosphites, and has been more extensively used than any other preparation.

It is employed for the same purposes as the salts of which it is formed, and in many cases it will prove an efficient preparation. Still we believe that the salt of lime, in a majority of cases, will be found the most advantageous agent.

The dose will be a teaspoonful three or four times a day.

EUCALYPTUS.

THE LEAVES OF EUCALYPTUS GLOBULUS.—U. S.

Preparation.—Tincture of Eucalyptus.

Dose.—From five drops to half a drachm.

Therapeutic Action.—The Eucalyptus is tonic, stimulant and antiseptic. When taken into the stomach it imparts a sense of warmth, which sometimes extends to all parts of the body. It strengthens the pulse, and increases the temperature.

It is claimed that when the temperature is low, or unequal in different parts of the body, this remedy may be used with prominent advantage. It is said to improve the appetite and digestion, but my experience does not confirm this. It is also claimed that it is antiperiodic, and may be substituted for quinine in many cases. But I anticipate, that here also, its good effects are dependent rather upon its stimulant influence upon the circulation, than any antiperiodic property.

To a limited extent, it is antiseptic, but we would hardly select it when we have remedies that are so much better.

BOLETUS.

THE ENTIRE FUNGUS BOLETUS LARICIS—EUROPE.

PREPARATION.—Tincture of Boletus.

DOSE.—℞ Tincture of Boletus gtt. v. to gtt. x., water ℥iv.; a teaspoonful every hour.

THERAPEUTIC ACTION.—Boletus influences the nervous system, strengthening innervation, and through this blood-making and nutrition. It has been used in intermittent and remittent fever where the patient lacked nervous energy, with good results. Probably its use will be restricted to these cases, as for the ordinary purposes of a tonic we have much better remedies.

AMMONII CARBAZOTAS.

DOSE.—From one-eighth to one half grain.

THERAPEUTIC ACTION.—Carbazotate of Ammonia has been successfully employed as an antiperiodic, taking the place of quinine. We can not as yet describe the cases to which it is especially applicable, and therefore it will be first employed when quinine has failed to "break the ague." But if the cases in which it is curative are studied, we must be able after a time to prescribe it rationally. The dose is very small, but as it is intensely bitter, it should be administered in the form of sugar coated pills.

PHOSPHIDE OF ZINC.

Dose.—From one-thirtieth to one-sixteenth of a grain in pill, frequently with one-fourth grain of nux vomica.

Therapeutic Action.—Phosphide of Zinc has been employed as a nerve tonic and stimulant, being a better remedy than phosphorus. Its value in these respects has of late been fairly tested in the exhaustive stages of typhoid and other fevers, when the nervous energies have been so far prostrated as to render convalescence, if not doubtful, at least tedious and protracted. The great value of the phosphide is evinced in the most distinct manner when used in the treatment of neuralgia, in angina, loss of memory, and impotence, in loss of sleep from mental anxiety, and generally in those nervous affections that owe their origin to exhaustion and depression of nerve force.

CUPRUM.

Preparations.—Tincture of Acetate of Copper (Rademacher's. Sulphate of Copper.

Dose.—Of the tincture, gtt. x. to gtt. xx., to water ℥iv.; a teaspoonful four times a day. Of sulphate of Copper, grs. 1-10 to gr. j.

Specific Indications.—The surface is pallid, yellowish or greenish; the tongue is broad, and has a bluish or greenish pallor; the tissues are full, but soft and doughy.

Therapeutic Action.—Following the above indications, we find that copper improves the appetite and blood-making, the tissues grow firmer, and the patient is able to take the necessary exercise. I have employed it successfully in anemia, leucocythemia, and in chlorosis, when the ordinary tonics and restoratives had failed.

In the experiments conducted at the Pisa Hospital, it was determined that "sulphate of copper powerfully purifies the nutritive function by virtue of the greater activity which it induces in the internal processes of tissue change; and hence it is indicated in all states of the organism in which there is deficiency or atony of nutrition and impoverishment of the blood."

ARSENICUM.

Preparation.—Fowler's Solution.

Dose.—From the fraction of a drop to two drops.

Therapeutic Action.—In *small* doses, and when indicated, Arsenic may be regarded as a vital stimulant, and one of the most powerful of this class. But we must not forget that the dose *must* be small, and there *must* be special indications for its use. What are these indications?

In that condition of blood, and of nutrition, where there is a tendency to the deposit of low or imperfect albuminoid material, yellow tubercle, caseous deposits, or degeneration of tissue, Arsenic may be used as a blood-maker, and especially to improve nutrition.

A class of skin diseases depending upon such deposits or on enfeebled nutrition, is cured by Arsenic. Among these are the more chronic affections, the squamæ, chronic vesiculæ, some of the pustulæ, and the tuberculæ. It will not cure all cases, it will do harm if injudiciously used, but it affords relief in many otherwise intractable.

But it should never be employed where there is irritability of the nerve centers, and especially of the sympathetic. This rule, I think, is absolute, and must be constantly regarded. Arsenic is a *nerve-stimulant;* quite as much so as phosphorus, with this addition: that its action is greatly intensified when there is already erythism of the nerve centers.

It has been successfully employed in some cases of phthisis, presenting the condition above named. Prof. Howe uses it in combination with Veratum, and there is no doubt that this renders the system tolerant of Arsenic where it could not otherwise be employed.

Arsenic is topically employed to destroy malignant growths. The majority of the "cancer specialists" use it in some form, and their preparations differ only in the inert material with which it is combined. The preparation now employed most frequently is made as follows: Take Hydrated Sesquioxide of Iron a sufficient quantity, throw it on a paper filter, and when of the consistence of ointment, add an equal part of Lard. To this add Arsenious Acid, in the proportion of ʒss. to ʒj. to the ounce.

Arsenic may be employed in the treatment of some cases of intermittent fever with excellent results. They are those marked by impairment of sympathetic innervation, and with a general want of nervous excitability. The dose should be very small, gtt. v. to x. of Fowler's Solution to ℥iv. of water; a teaspoonful every two or three hours. I have used the Homœopathic pellets, medicated with Fowler's Solution, and though the dose was not more than the twentieth to the one-hundredth of a drop, the effect was marked, where specially indicated.

It is also used with advantage in atonic diarrhœa, with indigestion, the conditions being as above named. Especial benefit has been observed in those cases in which there were periods of great depression, followed by hectic fever.

CLASS XI.

ALTERATIVES.

Alteratives are defined to be agents which change, in some *insensible* and *inexplicable* way, certain morbid actions and conditions of particular organs, or of the general system. They produce no sensible evacuation, or modification of function, by which we can in any way judge of their mode of operation. They are administered to counteract certain morbid habits of the body, or cachectic states of the constitution, and to reëstablish the healthy functions of deranged organs.

Their precise *modus operandi* is involved in much obscurity. Doubtless much efficacy is occasionally attached to certain articles commonly regarded as alteratives, when their supposed salutary influence is wholly the result of the recuperative powers of the system. Nevertheless, an inquiry into the action of this class of agents, though it may be somewhat speculative, will not, it is believed, be wholly uninteresting to the therapeutist.

The term alterative is extremely indefinite, since nearly every article in the materia medica may alter, modify or change the action of certain organs or parts, promote diminished or suppressed secretions, restrain them if too profuse, change them if abnormal or vitiated, and thus exert either a direct or indirect alterative influence upon the system. Yet these agents produce some sensible impression, some perceptible influence upon certain organs or secretions, or upon the general system, which will characterize their action, and impress the mind with the difference between them and agents of this class which act in the manner defined above.

It can not be disputed that many of the articles which we call alteratives do act in sensible ways upon the system, as well as in the *insensible* manner referred to. Some of them act as general or special excitants upon certain organs or tissues, or as corroborants; but these influences do not seem to be sufficient to explain their curative action in those affections in which they are administered. There are other articles which possess very similar properties, and exert the same or similar sensible influences upon the system without producing that important alterative influence so desirable in certain chronic diseases. That the value of these agents as alteratives is dependent in part upon their sensible influence upon the system, we think can not be doubted; but their special influence in certain forms of disease must be dependent upon some action not yet determined. We may speculate on this peculiar action, but, although our reasoning may be correct, in the present state of our knowledge we can not demonstrate it to be so.

We suppose, from their known effects, that alteratives may act in the following way: 1. They may change the condition of the blood by a direct influence exerted upon it after the absorption of the remedy; and this change may be either *chemical* or *dynamical*. 2. They may in some manner effect the removal of the worn-out tissues, and favor the process of nutrition. 3. They may neutralize or change the character of decomposing or noxious agents that exist in the system as the result of some pathological process, or that have been introduced from without. 4. They undoubtedly favor elimination by stimulating the excretory organs to increased activity.

In order that alteratives should act in the ways mentioned above, it is necessary that they should be absorbed. We find that all agents of this class are soluble in the fluids of the body, and hence are necessarily absorbed; and as further proof of this, many of them may be detected in the secretions.

The alkaline alteratives, as well as the *halogenous* bodies, iodine, chlorine and bromine, doubtless exert their influence in all four of the ways mentioned. Thus, they change the condition of the blood by acting chemically upon it; they tend to break down the worn-out tissues of the body, and thus prepare the way for nutrition; they change the character of some of the products of decomposition, so as to permit of their excretion; and they act as direct eliminatives, stimulating one or more of the excretory organs to increased action.

The vegetable alteratives may act in a similar manner;

though as they are complex organic bodies, and subject to change when introduced into the system, we have no means of knowing either their chemical or dynamical influence upon the blood, or upon the tissues. That they may exert even a more powerful chemical influence than the agents first named, is not impossible. They may add something to the blood, or take something away from it; or by their mere presence they may give rise to a chemical action between the constituents of that fluid, in a manner similar to the action of emulsine, when added to the material of the bitter almond—by its presence giving rise to the formation of hydrocyanic acid.

All the agents of this class that have any well marked influence upon the system, prove directly eliminative; they either increase the secretion of the kidneys, skin or bowels, and the greater their power in this respect, the more efficient are they as alteratives. Thus the stillingia, when given in large doses, is cathartic and emetic; in small doses, it increases the secretion of the kidneys, bowels and skin. The compound sirup of stillingia produces a marked increase of all the secretions. Podophyllum, iris versicolor, juglans cinerea, alnus serrulata, chimaphila, etc., all act in a similar manner. We may say, then, that whatever action these agents have in the manner spoken of in the three first propositions, and they undoubtedly have some, they exert a beneficial influence by eliminating morbid material from the system. The reason why this action has not been fully recognized, is probably from the fact that this increase of the secretions is but gradual, and comparatively small to that produced by agents acting directly and quickly upon these organs.

In regard to the therapeutic application of this class of remedies, we will have to refer the reader to the description of the separate agents, as each of them exerts an influence peculiar to itself. As to their general application, they are employed in all chronic diseases in which there is a depraved or vitiated condition of either the solids or fluids. Thus, they are used in *scrofula*, *syphilis*, *scorbutis*, *tabes mesenterica*, *chronic hepatitis*, *dyspepsia*, *chlorosis*, *chronic rheumatism*, *chronic cutaneous diseases*, *etc.*

In many morbid conditions of the system, in which this class of agents are indicated, in addition to medicines, a change of air, diet, habits, scenery, employment, society, etc., will tend in a very marked manner to improve the mental and physical condition of the patient, and coöperate with the medicinal measures employed in restoring him to a state of health. The cold shower-bath, douche, alkaline or salt hand-bath, the medicated vapor-bath, etc., by keeping the skin in a healthy condition, and by their exciting effects upon the nervous system, also become valuable auxiliaries to the use of the remedies under consideration. In addition to these measures, especial attention should be paid to the regimen of the patient. A diet mild and unirritating in its qualities, easy of digestion, and nutritious, if taken in moderate quantities, will greatly contribute to the restoration of health; it furnishes the necessary quantity and quality of chyle for the formation of the blood, and thus acts as a healthy excitant to the vascular and nervous systems, furnishing healthy materials for the nutrition or renovation of impaired organs. In addition to the use of alteratives and a correct regimen, such agents will have to be employed from time to time as are demanded to fulfill special indications, as cathartics, emetics, diuretics, diaphoretics, sedatives, etc.

Thus it will be seen that a reliance on any one class of medicines, or on particular agents or remedial measures alone, in the treatment of these chronic diseases, would prove unsuccessful. It is by a combination of medicines, influences, and changes in the management of disease, that we accomplish cures. Repeated changes in the remedial, dietetic, physical, and mental influences, should be had recourse to in such cases. As one medicine or class of agents, one form of diet, or the physical and mental influences, lose their salutary effects upon the system, others should be substituted for them. In this way many cures may be effected that would resist a routine practice, and bid defiance to the most potent medicines. The superiority of one physician over another in many instances arises from the judicious selections and modifications which he makes in the various remedial measures employed, and in their adaptation to the various phases of the disease, and to the different states of the system.

PHYTOLACCA.

THE ROOT OF PHYTOLACCA DECANDRA.

Preparation.—Tincture of Phytolacca (the fresh root).

Dose.—From the fraction of a drop to twenty drops. Usually we add gtt. v. to ʒss. to water ℥iv.; the dose being one teaspoonful.

Specific Indications.—The mucous membranes are pale, and the epithelium gives way, showing vesicles, erosions, ulceration. Deposits in and upon the mucous epithelium, of an ashen-gray color, enlargement of lymphatic glands with pallor, mammary pain or inflammation, irritation of the salivary glands, or of the testes.

Therapeutic Action.—The Phytolacca is emetic, cathartic, alterative, and discutient. It acts as an emeto-cathartic, and exhibits some acro-narcotic powers, such as impaired vision, vertigo and drowsiness. In over-doses, it is said to cause excessive vomiting and purging, with great prostration, and occasionally convulsions. The dust inhaled, while pulverizing the root, produces severe coryza, with headache and prostration.

As an *alterative*, in chronic rheumatism, mercurial rheumatism, secondary syphilis, etc., but few agents are known to the profession which are so searching or more truly alterative. For this purpose the root, extract of the root, berries, or inspissated juice of the berries, or the tincture, may be prescribed alone, or combined with other agents; while the root may be roasted and applied to the part affected in the form of a poultice, or the saturated tincture or extract may be used as a local application.

The first and most important use of Pbytolacca, is its specific action in diphtheria. The name here indicates a special pathological condition, and we might expect to find a remedy which would meet the larger number of cases. Unless there is a strong indication for other remedies, I prescribe this as follows: ℞ Tincture of Aconite gtt. v., Tincture Phytolacca gtt. x. to gtt. xx., water ℥iv.; a teaspoonful every hour. Hundreds of cases have been treated with these remedies alone with a success almost marvellous. Of course, the treatment must be commenced early. If a patient's blood is saturated with the poison, and the tissues of the throat are dying, we could not expect success.

Phytolacca is a prominent remedy in stomatitis. Infantile sore mouths yield readily to it, and for the ordinary sore mouths of adults, we rarely think of another remedy. It is not so certain in nursing sore mouth, but yet it will cure some cases better than any other single remedy.

It is the remedy for threatened mammary inflammation. It should be given early in the disease, with the commencement of engorgement, heat, pain, and redness. It is so positive in its action, that in the larger number of cases the inflammation can be aborted. This use of Phytolacca should be widely known, as it will prevent the severe suffering that attends the usual course of mammary inflammation, terminating in suppuration. As an application to the inflamed breast, nothing is better than the powdered root, wetted with warm water, or even the tincture with water.

Phytolacca is a valuable remedy in many cases of sore nipples, and when the child has a sore mouth, both mother and child should take the remedy.

It is the remedy for parotitis or mumps, when a remedy is needed, and I rarely think of giving anything but this and Aconite.

It is also a good internal remedy in orchitis, and may be combined with Cannabis, Veratrum, Belladonna, or Gelseminum, according to the indications.

An infusion of the leaves has been found useful in hemorrhoids, taken in doses of a wineglassful five or six times daily, and at the same time use as a lotion to the piles, or as an injection. An ointment of the leaves or root will be found serviceable in the same disease, and may also be used with much advantage in scabies, psoriasis, tinea-capitis, etc. The root has been used to keep open fistulous pipes, and as a gentle escharotic and excitant to old and indolent ulcers. The root may also be roasted and applied to scirrhous and scrofulous tumors, bronchocele, indurated and enlarged glands, and as an application to felons, as a discutient, with much advantage. In febrile affections the root may be roasted and applied to the feet as a revulsive.

STILLINGIA.

THE ROOT OF STILLINGIA SYLVATICA.

Preparations.—Tincture of Stillingia. Oil of Stillingia.

Dose.—The dose of the tincture will vary from gtt. j. to ʒss. Of the oil, the fraction of a drop.

Therapeutic Action.—Stillingia is alterative, and in large doses emetic and cathartic; it is employed exclusively for its alterative properties. It has been extensively used by Eclectic physicians during the last forty years, and we hear but one report of its action; and that is, it is one of the most efficient of the vegetable alteratives.

It is evident that it increases the action of the skin, as we find that under its influence this tissue regains its tone, and the secretion is free and constant; we are also convinced that it increases the secretions of the kidneys and bowels in a marked manner.

The Stillingia, either alone or in combination with other alteratives, has been employed successfully by hundreds of physicians in the treatment of scrofulous disease in all its forms. It, like all the more efficient agents of its class, does not, in a majority of cases, produce immediate results; it has to be continued for weeks, or sometimes, though rarely, months.

In secondary and tertiary syphilis it is considered by many of our best practitioners to be one of the most efficient agents in the materia medica for the eradication of the disease.

It possesses valuable pectoral and expectorant properties. Professor Morrow used it in the incipient stages of phthisis, complicated with strumous habit, in chronic bronchitis, chronic laryngitis, and especially in that hoarseness and chronic laryngeal affection to which public speakers are liable. In the last-named affection he regarded it as almost a specific, a small piece of the root being masticated from time to time through the day, and swallowed. He reported that in these affections it invariably afforded more relief than any other agent he had ever administered, and others corroborate this statement.

The fresh root of the Stillingia should always be employed, as it deteriorates greatly by age.

We have employed the oil of Stillingia with great advantage, in chronic laryngitis and bronchitis, and for the cure of cough, when arising from irritation of the air-passages or lungs. We use it in doses of one drop, given on sugar, letting it slowly dissolve in the mouth, and swallowing without water.

Tinctura Oleum Stillingia Compositus.—℞ Oil of Stillingia, Oil of Lobelia, *aa.*, ʒij., Oil of Cajeput, ʒj., Alcohol ℥iij.; mix. This, sometimes called the compound Stillingia liniment, is the most efficient remedy for the cure of long standing and obstinate coughs arising from irritation of the respiratory passages, which we know of. For this purpose we direct from one to two drops upon a lump of sugar, two or three times daily, and if there is any affection of the larynx, that it be freely applied to the throat. It is also an efficient remedy in the first stages of croup; give to a child two years old, one-half to one drop upon a lump of sugar, every hour or two, or oftener if necessary. It is also one of the best applications to the throat in croup; in spasmodic and mucous croup it frequently proves sufficient of itself to control the dissease.

CORYDALIS.

THE ROOT OF CORYDALIS FORMOSA.

PREPARATION.—Tincture of Corydalis.

DOSE.—From two to twenty drops.

THERAPEUTIC ACTION.—Corydalis is alterative, tonic, diuretic and diaphoretic; it is principally used as an alterative, it being one of the most efficient of the vegetable class.

We have employed it principally in the treatment of syphilis, in which it has exerted a good influence. We have used it in cases where the general system has become (if we may so speak) saturated with the disease, as manifested by a syphilitic eruption upon the surface, ulceration of the fauces, loss of hair, nodes, nocturnal pains, syphilitic iritis, etc., with entire success.

In scrofula and other cachectic diseases, it is employed with much advantage; in fact some report that this agent alone, given in decoction, has proved more serviceable in their practice than any of the many alterative syrups.

We have found it exceedingly valuable in certain derangements of the stomach, attended with profuse morbid secretion of mucus, there being always a coated tongue, with fetor of the breath, loss of appetite and loss of digestive power.

It has also been employed with success in chronic inflammation of the kidneys, and in fact of all the urinary passages, and in chronic diarrhœa and dysentery.

SARSAPARILLA.

THE ROOT OF SMILAX OFFICINALIS.

Preparations. — Tincture of Sarsaparilla. Syrup of Sarsaparilla.

Dose.—Of the tincture, ʒss. to ʒj. Of the syrup ʒj. to ℥j.

Therapeutic Action.—Sarsaparilla is alterative, diaphoretic and diuretic. Diaphoresis most frequently follows its exhibition when the surface is kept warm; but if kept cool, it produces diuresis. Authors, however, suppose these effects are attributable, to a great extent, to the amount of liquid taken with it; for when given in substance, in large doses, nausea, vomiting and impaired appetite, were the only perceptible effects.

In cachectic states of the system, it acts as an alterative, improving the appetite, facilitating digestion, augmenting the strength, constitutional and mental capacities of the patient, with an improvement or entire relief of the morbid condition for which it was exhibited. It is not employed as a tonic, its exhibition being confined almost exclusively to depraved or vitiated states of the system, owing to its reputed *alterative* powers. Some species possess nutritive and demulcent properties.

GUAIACUM.

THE WOOD AND RESIN OF GUAIACUM OFFICINALE.

Preparation.—Tincture of Guaiacum.

Dose.—From five drops to one drachm.

Therapeutic Action.—Both the wood and resin are alterative, diaphoretic, stimulant and diuretic. Guaiacum wood is sightly acrid and stimulant, depending upon the extractive principle which it furnishes. Its decoction occasions thirst, dryness of the mouth, warmth in the stomach with increased heat of the surface, and a more frequent pulse; and if the patient be confined to bed, it serves to promote cutaneous transpiration; or if the surface is exposed to the cool air, increased renal activity follows, and, if long continued, cardialgia, flatulency, and constipation; and it has been said to produce an eruption like measles when given in large doses.

GUAIACI RESINA.

Guaiac Resin is an acrid stimulant, its acridity depending upon the extractive principle or bark mingled with the resin.

In small and repeated doses Guaiacum effects changes upon the system and many morbid or constitutional states or taints are gradually removed without exerting any sensible effect upon the system, save a slight increase of the secretions. Owing to these silent, inexplicable, and imperceptible changes which it effects, it has been termed *alterative*.

Guaiac resin is a popular remedy in chronic rheumatism, or the declining stages of the acute. In the same disease, if complicated with secondary syphilis or scrofula, it has been found serviceable.

ARCTIUM.

THE ROOT AND SEEDS OF ARCTIUM LAPPA.

Therapeutic Action.—Burdock is described as alterative, diaphoretic, diuretic, aperient and resolvent.

It is a very excellent remedy, though but little used by most physicians. It is simple, mild and unirritating in its operation upon the system, but it is undoubtedly capable of exerting a highly sanative influence upon the nutritive fluids, and upon the constitution generally, by virtue of its depurative, resolvent and detergent qualities. It is not adapted to the relief of acute disease, its action being manifested upon the system only after its long continued use. It promotes the action of the exhalant and secreting vessels and organs to a slight extent, and acts as a mild alterative. Though alterative, it is too feeble an agent to be expected to effect the removal of a formidable or obstinate disease unaided by other means; nevertheless, it is a valuable auxiliary to more energetic remedies.

RUMEX.

THE ROOT OF RUMEX CRISPUS.

Preparations.—Infusion of Rumex. Tincture of Rumex.

Dose—Of the tincture, from five drops to one drachm.

Therapeutic Action.—Yellow-dock is alterative, tonic, astringent and discutient.

Many species of the Dock are employed for medicinal purposes, and are said to possess analogous properties. The species mostly used in this country are the R. Crispus, R. Obtusifolius, R. Aquaticus, R. Britanica, and R. Sanguineus. Of these, the crispus and obtusifolius have been mostly employed by the Eclectic School of Medicine, and, we believe, by physicians generally throughout the United States.

Dock appears to exert its silent alterative action upon the constitution in many chronic cutaneous eruptions, as scabies, the different forms of herpes, etc.; syphilis when it has assumed a constitutional form, attended with an ulceration of the fauces, eruption, or ulceration upon the surface; also in mercurio-syphilitic disorders, mercurial cachexy, rheumatism, cancerous tumors or ulcers, scrofula—whether manifested by a general depravation of the system, enlarged glands, or foul and indolent ulcers—or in any other forms of ulcer, especially if dependent upon some constitutional taint. In caries, necrosis, or other morbid conditions of the osseous system, in scurvy or scorbutic affections, and in numerous other abnormal states, its resolvent, depurative and detergent qualities render it an excellent auxiliary and corroborant.

SCROPHULRIA.

THE LEAVES AND ROOTS OF SCROPHULARIA MARYLANDICA.

Preparation.—Tincture of Scrophularia.

Dose.—From five drops to one drachm.

Therapeutic Action.—It is said to be alterative, diuretic, emmenagogue, discutient, vulnerary, emetic, and cathartic.

In chronic cutaneous diseases, used both internally and topically, it often affords relief. Obstinate ulcers, the result of a depraved state of the fluids and solids, are frequently benefited by its use. Secondary or ternary syphilis calls for its exhibition. In chronic glandular diseases and visceral obstructions, it has been found eminently beneficial, especially in hepatic torpor, and other morbid or deranged states of that viscus. In menstrual obstructions or irregularities, dysmenorrhœa, etc., some esteem it almost a specific.

Scrophularia is applied topically as a local anodyne, discutient, or resolvent and vulnerary agent. The fresh or even dried leaves may be bruised and simmered in milk and applied to cuts, bruises, painful and irritable ulcers, piles, swelling of the mammary glands, local inflammations, cutaneous eruptions, and abrasions of the surface, to relieve pain, allay irritation and inflammation. The root is also made into a poultice or fomentation, and employed to discuss indolent tumors and glandular swellings.

SAMBUCUS.

THE FLOWERS, BERRIES AND INNER BARK OF SAMBUCUS CANADENSIS.

Preparations.— An infusion. Tincture of Sambucus (the inner bark and root).

Dose.—Of the tincture, from five drops to one drachm.

Therapeutic Action.—The Elder is described as alterative, laxative, diuretic, diaphoretic, emetic, hydragogue, cathartic, and resolvent.

The flowers are esteemed valuable in all impurities of the blood, or cachectic states of the system, as in herpetic and all forms of chronic cutaneous eruptions, scrofula, old ulcers, and other depraved states of the system. Though feeble in action yet they are highly sanative, and serve to improve the nutritive fluids and promote healthy secretions. They are mildly diaphoretic, devoid very nearly of excitant qualities, and are deemed useful in the diseases of children when of a mild character, in obviating costiveness, and in lessening febrile excitement, and promoting diaphoresis and diuresis.

The inner bark is used as a hydragogue cathartic and diuretic in dropsy, and as an alterative in chronic diseases; if taken in large doses it causes emesis. It is said to have cured many cases of dropsy that had resisted other agents of reputed efficacy. It is prepared by boiling one ounce of the bark in two pints of water to one, of which the dose is from two to four ounces, repeated often; in smaller doses it acts as an aperient and resolvent; or it may be used in the form of a vinous infusion.

An ointment, prepared by simmering the inner bark in fresh butter, cream or lard, and adding a small portion of beeswax to harden it, is an excellent application in cases of burns, abrasions of the surface, eruptions, irritation and superficial inflammation; and when prepared in the same manner, with the addition of white-oak bark, it is an efficacious application to abraded parts, occasioned by long confinement to bed.

AMPELOPSIS.

THE BARK OF AMPELOPSIS QUINQUEFOLIA.

Preparation.—Tincture of Ampelopsis.

Dose.—From five drops to one drachm.

Therapeutic Action.—Ampelopsis is alterative, expectorant, tonic, diaphoretic, and subastringent. It has been employed by many Eclectics as an alterative in the various cases requiring the exhibition of these agents. It was first introduced to the notice of our physicians as a remedy in chronic disorders of the respiratory organs, as phthisis, chronic bronchitis, chronic laryngitis, etc., in which it was found, in many cases, to exert an influence which should recommend it to the attention of the profession.

It has been considerably employed in scrofula, and many times with evident advantage; likewise in chronic cutaneous affections, in which it has, in many instances, displayed important curative virtues.

ARALIA.

THE ROOT OF ARALIA NUDICAULIS.

Therapeutic Action.—This species of Aralia is described as alterative, diaphoretic, pectoral, depurative, and vulnerary; it is regarded by many as a valuable alterative agent.

A strong decoction of this agent may be employed in chronic diseases of a cachectic character, as scrofula, cancer, or when the carcinomatous diathesis exists; in syphilis either in the secondary or tertiary form; in chronic rheumatism, particularly if of a mercurial character; in herpetic affections, embracing every species indicating a general taint of the system, and also in all the various cutaneous diseases in which a general depurative or alterant course of medication is deemed appropriate or even indispensible.

It is also used in the same forms in chronic pectoral affections, as coughs, colds, catarrhal affections, phthisis, pain in the thorax arising from irritation or chronic inflammation of the respiratory organs.

ARALIA RACEMOSA.

THERAPEUTIC ACTION.—The Aralia racemosa is alterative, tonic, diaphoretic, stimulant, pectoral, and demulcent. The medical properties and uses of this agent are quite similar to those of the preceding species. As an alterative it is less frequently used than the Nudicaulis, although often used in domestic practice in the same diseases to fulfill the same indications. It is, however, more frequently employed in chronic pulmonic affections, as in phthisis, chronic catarrhal affections, coughs and colds.

MEZEREUM.

THE BARK OF THE ROOT AND STEM OF DAPHNE MEZEREUM.—EUROPE.

PREPARATION.—Tincture of Mezereum.

DOSE.—From one to ten drops.

THERAPEUTIC ACTION.—Mezereum is alterative, diaphoretic, diuretic, stimulant, cathartic, irritant, and vesicant. All parts of the plant are irritant, but the bark and fruit possess a high degree of acridity, producing irritation and inflammation of the organs to which they may be applied, even causing vesication when applied to the skin.

Mezereon is mostly employed as an alterative and diaphoretic in syphilis and mercurio-syphilis, scrofulous and chronic cutaneous affections. It is mostly used in conjunction with other agents in the form of diet-drinks, as sarsaparilla, guaiacum, etc. The bark has been found efficacious in venereal nodes, nocturnal pains, and in venereal tumors assuming a scirrhous character.

DULCAMARA.

THE TWIGS OF SOLANUM DULCAMARA.

Therapeutic Action.—Dulcamara is alterative, diaphoretic, diuretic, aperient, discutient and narcotic. It has been classed by some authors with narcotics, as when given in very large doses it produces vertigo, dimness of vision, nausea, vomiting, faintness, etc. In medicinal doses, if the surface is kept warm, it frequently acts as a diaphoretic, but if kept cool, as a diuretic.

It is principally employed as an alterative in chronic cutaneous diseases; more especially in those of a scaly character, as leprous psoriasis and pityriasis. It has also been employed with advantage in chronic diseases of the respiratory apparatus, and gouty and rheumatic affections.

CELASTRUS.

THE BARK OF THE ROOT OF CELASTRUS SCANDENS.

Preparation.—Tincture of Celastrus.

Dose.--From five drops to half a drachm.

Therapeutic Action.—Celastrus is described as alterative, diaphoretic, discutient, and emetic. Although employed by few, yet it is an indigenous remedy worthy of more extended notice than it has received at the hands of a majority of practitioners. The diseases in which it has been found especially beneficial, are scrofula, glandular swellings, secondary syphilis, mercurial cachexy, chronic cutaneous diseases, especially those of a scaly character, etc. As an alterative it may be employed in all cases attended with a depraved state of the general system.

ALNUS.

THE BARK OF ALNUS SERRULATA.—U. S.

Preparations.—Infusion of Alnus. Tincture of Alnus.

Dose.—Of the tincture, gtt. v. to ʒj.

Therapeutic Action.—Alnus is alterative, tonic, and slightly astringent; the inner bark is said to be emetic. It is an agent that has not been much employed by the majority of the profession, and yet those who have used it consider it one of our most efficient alterative agents.

We have employed it internally and as a wash in scrofulous eruptions on the skin, with more advantage than any other agent. It has also proved useful in cases of scrofula with glandular enlargement, and especially where there is suppuration of the lymphatic glands. In these cases we generally combine it with yellow dock in the form of a decoction, one ounce of each to one and a half pints of water, boiled down to one pint, expressed and strained, giving it in doses of one-half to one ounce three times a day, with the local application of the same. In the nursing sore mouth of women, these two agents combined, used as a wash, and taken internally at the same time, have proved very successful. We have also used it in various syphilitic skin diseases, with good results; we have also employed it in chronic bronchitis with profuse expectoration, with apparent good results. In these cases we have used equal parts of the Alnus, Rumex crispus, and Quercus rubra, either in decoction or syrup. It is said that the young twigs, cooked in lard until they are crisped, then strained, form a very good application to scalds and burns.

SASSAFRAS.

THE BARK OF THE ROOT OF SASSAFRAS OFFICINALE.

DOSE.—The infusion or decoction may be taken freely.

THERAPEUTIC ACTION.—Sassafras is alterative, diaphoretic, diuretic and stimulant. Taken in the form of a warm infusion, it forms a very agreeable diaphoretic in many diseases; if taken cold, the body being kept cool, it frequently acts as a diuretic. It is much employed as an alterative and diaphoretic in chronic rheumatism, and in scorbutic, venereal, and cutaneous diseases, mostly, however, as an adjunct to improve the taste of other remedies. The warm infusion is esteemed very valuable as a diaphoretic in the acute exanthemata, to promote the eruptive process.

The bark converted into a fine powder, and made into a poultice, by combining it with ulmus fulva, corn-meal, etc., forms a valuable antiseptic, detergent and topical stimulant, and as such it may be applied to indolent and gangrenous ulcers, contused, sloughing or gangrenous parts, and to parts threatened with mortification.

The medulla or pith of the young shoots, forms a limpid mucilage by maceration with water, and is one of the best local applications, in acute conjunctivitis, with which we are acquainted. The leaves macerated in water, yield a mucilage, which will be found a pleasant and demulcent drink, in febrile diseases, or in any case where there is irritation or inflammation of the stomach or bowels.

TARAXACUM.

THE ROOT OF LEONTODON TARAXACUM.

PREPARATIONS.— Extract of Taraxacum. Tincture of Taraxacum.

DOSE.—Of the extract, gr. j. to grs. v. Of the tincture, gtt. v. to ʒss

THERAPEUTIC ACTION.— Taraxacum is alterative, tonic, cholagogue, aperient and diuretic.

In small doses it acts as a tonic and stomachic, and in larger doses as an aperient. Its diuretic action is, in most cases, manifest, though not in all cases so obvious and so constant as its other effects. In chronic disorders its long continued exhibition is followed by alterant, resolvent and deobstruent effects.

Taraxacum is much used in chronic affections of the liver, both functional and organic, as in engorgements, obstructions, torpor or deficient biliary secretion, jaundice, chronic inflammation, enlargements, congestions, or indurations of that organ; also in dropsies occasioned by hepatic obstructions, and likewise in constipation or habitual torpor of the bowels, and dyspepsia dependent upon the same causes.

HISPIDULA.

The Gaultheria Hispidula, or Creeping Wintergreen, is said to be an article of much value as an alterative in scrofula, cancerous affections and cachectic states of the system.

In cancerous cachexia, some have asserted it was capable of entirely eradicating the diathesis when it exists; and even when scirrhous tumors are formed, it is said to disperse them; and it is said to be equally valuable in scrofula and scrofulous swellings. In cases of old ulcers, it has been found valuable, both as an internal and external agent, and the same has been said of it in prolapsus uteri; while the infusion is taken freely, it is at the same time employed as an injection per vagina. It is used in the form of an infusion, which may be taken very freely.

VERNONIA.

PREPARATION.—Tincture of Vernonia.

DOSE.—From five to twenty drops.

THERAPEUTIC ACTION.—Vernonia Prealta, or Iron Weed, is said to possess alterative, emmenagogue and discutient properties.

It has been used to a limited extent as an alterative in chronic glandular enlargements, chronic skin diseases, and other diseases requiring this class of remedies.

It has been found of much utility in uterine derangements or irregularities. In cases of scanty or suppressed catamenia it is said to be an excellent remedy to promote that secretion, and in cases attended with redundant or too profuse a discharge, it is said to possess the power to restrain it. In such cases, with sterility, it is said to favor conception.

PYROLA.

Pyrola Rotundifolia, Thin-leaf or Pear-leaf Wintergreen, is astringent, alterative, tonic, antiseptic, anodyne and diuretic.

It has been found to exert an admirable influence in many diseases of a cutaneous character, especially in those attended with irritation of the surface or cutaneous inflammation. It seems to lessen the inflammation and itching upon the surface, and in a short time removes the disease: it should be used both internally and externally. In local inflammatory affections, as in burns, tumors, bruises, injuries, carbuncles and ulcers, in which there is pain, irritation, or a tendency to gangrene or mortification, it lessens the pain and local inflammation.

CHIMAPHILA.

Pipsissewa, described under the class of Diuretics, is possessed of important alterative properties, together with diuretic, sudorific, tonic and astringent qualities. This article is not usually alluded to under the class of alteratives, but its merits justly entitle it to special notice in this place. It has been used with great success in scrofula, both before and after ulceration has taken place.

SAPONARIA.

Saponaria Officinalis (Soapwort, or Bouncing Bet), is esteemed alterative and deobstruent, and as such it has been used in Germany in secondary syphilis, scrofulous habits and jaundice; also in hepatic derangements, visceral obstructions and cutaneous affections. It is said to act upon the system in a manner similar to the sarsaparilla, and some physicians have esteemed it superior to that article. The decoction is freely used, from two to four pints being taken in the twenty-four hours. Half an ounce of the inspissated juice may be used daily. It is said to cure gonorrhœa without any other medicine.

HEPATICA.

Different species of Liverwort are said to possess alterative, deobstruent, tonic, diuretic, demulcent, astringent, and pectoral properties. Many esteem them useful in hepatic chronic derangements, and chronic pectoral affections, as coughs, hemoptysis, etc.

SILPHIUM PERFOLIATUM.

PREPARATION.—Tincture of Silphium Perfoliatum.

DOSE.—From one to ten drops in water.

The action of this variety of Silphium, if we are to believe the reports of the few who use it, is very direct and certain upon the chylopoietic viscera. It is claimed that it is one of the best remedies in the treatment of ague-cake, and congestion of liver and spleen, so frequently associated with chronic intermittents.

ERYTHRONIUM.

Dose.—Of the powder. from ʒss. to ʒj.; of the infusion, from ℥ij. to ℥iv.; aqueous extract, gr. v. to gr. x.

Adder's Tongue is said to be a valuable remedy, used both internally and externally, in scrofula. The leaves and root boiled in milk, and the infusion or decoction, taken in scrofulous affections, applying a poultice of the same to the ulcer or swelling when it exists, is said to be a remedy of much value, and one that will often alleviate and even remove the disease. It is said to possess tonic, astringent, and diuretic properties. The recent root is said to be emetic. It has been used in dropsies and diarrhœa, and as a gargle in mercurial sore throat.

MENISPERMUM.

Yellow Parilla (described under tonics), is a very important article, not duly appreciated by the profession. Most authors pass it unnoticed: the U. S. Dispensatory barely alludes to it. It is a valuable tonic, alterative, and corroborant; highly useful in scrofula, secondary syphilis, mercurio-syphilis, cutaneous diseases, and in the shattered or broken down states of the system, caused by mercury, dyspepsia, convalescence from fever, etc. It is used in the form of infusion, decoction, tincture, or syrup, either alone or conjoined with other agents.

JUGLANS CINEREA.

"The leaves of the Walnut have been highly extolled of late by M. Negrier, as superior to all other antiscrofulous remedies. The extract of the leaves, which may be ranked in the class of slightly aromatic bitters, he found to be almost always efficacious in scrofulous affections, and in no case did it appear to exert any unpleasant action on the economy. Their efficacy is doubtless overrated by him, and their main virtues would appear to be those of the aromatic bitter tonics." The medical virtues of the bark indicate that the leaves may also be of service in the cure of disease. They merit a fair trial.

OLEUM MORRHUÆ.

Dose.—The dose is ℥ss., increased to ℥ij. or ℥iij., two, three or four times a day; a drachm or two of rye whisky combined with each dose makes it much pleasanter to the taste. Its use must be continued for a considerable length of time, in order to obtain its full beneficial influence.

Therapeutic Action.—Cod-liver oil is described as alterative, nutritive, laxative, diaphoretic and diuretic. Its possession of the three last properties, however, is extremely problematical. It has been employed with more or less success in phthisis pulmonalis, tabes mesenterica, chronic inflammatory affections, especially those of a scrofulous or tubercular character, chronic rheumatism and gout, chronic diseases of the skin and bones, scrofulous diseases of the joints; in fact, in all chronic diseases where there was evidence of defective nutrition. We have employed it in many cases in which it appeared to exert a beneficial effect, and in cases again where it failed of producing the least beneficial influence.

We have seen it stated that other fats had proved themselves equal to Cod-liver oil in the treatment of phthisis, and that this agent only proved beneficial, by furnishing material for the production of heat, thus preventing destruction of the tissues. In two cases of phthisis, where, from the repugnance of the patient to Cod-liver, this could not be taken, we resorted to the use of beef-suet, and it certainly produced good results.

Cod-liver oil, when first exhibited, frequently occasions nausea, sometimes vomiting and disagreeable eructations, but in a majority of cases these effects are overcome.

IODINUM.

Dose.—From one-tenth to one grain in form of pill.

Therapeutic Action.—Iodine is described as alterative, resolvent, liquefacient, discutient, deobstruent, excitant, diuretic, diaphoretic, emmenagogue, sialagogue, irritant and vesicant.

The medical properties ascribed to it are numerous, and as yet imperfectly understood, and its uses exceedingly various

Enough, however, is known to render it one of the most prominent articles of the materia medica. Its local action is that of an irritant and corrosive. It imparts an orange color to the skin, and produces redness, irritation and desquamation. Its tincture, when applied to a secreting surface, acts as a desiccant.

Taken internally it increases the vital actions, particularly those of the glandular and absorbent systems; in other words, it acts as a liquefacient and resolvent. Its action is varied, depending upon the dose, combination and state of the system, as irritant, corrosive, desiccant, tonic, emmenagogue, diuretic, sialagogue, diaphoretic, deobstruent, resolvent or alterative.

Taken in small doses its action is sometimes imperceptible. In some cases it promotes the appetite and acts as a tonic, while in other cases, by its protracted use it occasions gastro-enteritis, nausea, loss of appetite, a loose state of the bowels and colics, and sometimes salivation with soreness of the mouth.

Iodine has been mostly employed in diseases of the glandular and absorbent systems It has proved eminently useful as a liquefacient and resolvent in chronic enlargements of the abdominal viscera, particularly the liver, spleen and ovaries; also in indurations and enlargements of the lymphatic and other glands, thickening of membranes, as the periosteum, tumors, scrofulous affections in all their multifarious forms. abscesses, ulcers, caries of the bones, etc. The diseases in which it is esteemed valuable are exceedingly numerous.

In diseases of the liver attended with chronic inflammation, induration and enlargement, Iodine, associated with or given in alternation with podophollin, and other agents of an alterative and hepatic character, may be employed with a fair prospect of benefiting the patient. The enlarged spleen has been frequently relieved or cured by Iodine. The enlarged liver and spleen following ague are often speedily removed by it.

Indurations, hard tumors, and enlargements of the uterus have been, if we can rely upon reports, entirely removed by the internal and external use of Iodine, aided by other appropriate medication. Iodureted ointments are to be applied to the cervix uteri every night for ten minutes by the finger, a piece of sponge attached to a tube or stick, or camel's hair pencil. The time required to effect a cure, in curable cases, is from two to four months.

Ovarian tumors, chronic tumors of the mammary glands, enlargements and indurations of the prostate, parotid, and lymphatic and mesenteric glands, have been materially benefited by the use of Iodine; their further growth has been arrested, and in many instances they have been entirely cured; in others, greatly relieved.

It has been employed as a local application to check and control the ulcerative process. It is said to check the most active suppurative action speedily, and cause healthy granulations to appear upon the diseased surface.

POTASSII IODIDUM.

DOSE.—From one-half to ten grains.

THERAPEUTIC ACTION.—Iodide of Potassium is alterative, deobstruent, liquefacient, and diuretic. On man its physiological effects and therapeutic uses are similar to those of the iodine.

Its local action is irritant, causing, when taken in large doses, nausea, vomiting, heat and pain in the stomach, and purging; applied to the skin it causes rubefaction. It possesses much less activity than the free iodine, and may be exhibited with greater freedom, without occasioning gastro-enteritis. It produces but slight chemical changes upon the tissues. It is absorbed into the circulation, and thrown off by the different secretory organs; it is detected in the blood and all the secretions.

Its romote or constitutional effects are similar to those of iodine. It promotes diuresis, acts as an aperient, occasionally as a sialagogue, and cases of wasting of the mammæ and testicles are reported; headache, wakefulness, pain and increased secretion from the pituitary membrane, have in some instances followed its exhibition.

The diseases in which the iodide of potassium is used, are the same as those enumerated under the head of Iodine, since the two agents are for the most part identical. The diseases enumerated, in which it is applicable, are scrofula in all its diversified forms, goitre, induration and enlargements of glands, tumors, thickening of the periosteum, or periosteal nodes, secondary syphilis, mercurio-syphilis, venereal tubercles and eruptions, chronic cutaneous diseases, strumous sores and eruptions, articular rheumatism, scrofulous ophthalmia, mammary tumors, enlargements of the liver, amenorrhœa, leucorrhœa, ascites, hepatic diseases, mercurial tremors, lead poison, etc.

FERRI IODIDUM.

PREPARATION.—Syrup of Iodide of Iron.

DOSE.—Of Iodide of Iron, from one to five grains. Of the syrup, from five drops to one drachm.

THERAPEUTIC ACTION.—It is alterative, tonic, diuretic, emmenagogue, laxative and resolvent.

When given in small and repeated doses, it blackens the stools, promotes the appetite and digestive powers, and passes off through the urine. If it does not cause purging, diuresis follows. In full doses (grs. x), it is apt to produce uneasiness in the epigastrium, nausea, slight headache, and copious black stools, with an increased flow of urine.

In its physiological effects upon the system, it more closely approaches the preparations of iron than iodine. It is readily absorbed into the circulation, when taken.

It is indicated as a tonic and resolvent in cases of debility, attended with a paleness of the skin, and a soft relaxed state of the solids. It is especially recommended in glandular affections occurring in scrofulous subjects.

In tabes mesenterica, and swellings of the lymphatic and cervical glands, visceral obstructions, chlorosis, leucorrhœa, atonic amenorrhœa, obstinate syphilitic ulcers, secondary syphilis occurring in strumous habits, anæmia attended with disturbance of uterine functions, atonic dyspepsia, a torpid state of the nutritive system, scrofulous, cutaneous, scorbutic and tubercular cachexia, hydropic affections resulting from visceral obstructions or anæmia, or chlorotic states of the system, the Iodide of Iron has been found useful, and in many of them eminently beneficial.

SULPHUR.

DOSE.—As an alterative, from ten grains to one drachm.

Sulphur, already fully described in other parts of the work, is an important alterative. It is a deservedly popular remedy in chronic cutaneous diseases of all kinds, but especially in scabies. It is often associated with guaiacum and other agents in the treatment of gout and acute rheumatism. We have found it useful in chronic rheumatism, mercurial rheumatism, mercurio-syphilitic and other cachectic affections, associated with the inspissated juice of the Phytolacca decandra.

Sulphur, when converted into sulphurous acid by burning, and its vapor brought into contact with the skin, often proves eminently serviceable in inveterate cutaneous diseases, as scabies, impetigo and squamous affections.

POTASSII SULPHURETUM.

Dose.—From three to ten grains, dissolved in aromatic water or made into pills.

Sulphuret of Potassium, when exhibited in small doses, acts as a general stimulant, augmenting the heat of the body, the force and frequency of the pulse, and the quantity of the different secretions. In large doses it acts as an energetic acro-narcotic poison.

It has been used as an internal remedy in inveterate cutaneous diseases, as lepra, psoriasis, etc., after they have resisted all the other means of treatment. It has likewise been exhibited as a resolvent in glandular enlargements, and to remove exudation the result of inflammation.

It is employed externally as a lotion or ointment, in the various obstinate cutaneous diseases of a scaly character, as eczema, lepra, scabies, etc. A lotion may be formed by adding ℥j. to two or three quarts of water; an ointment by incorporating ʒss. with ℥j. of lard.

AQUA CALCIS.

Dose.—From one drachm to two ounces.

Therapeutic Action.—Lime exerts a specific action in diseases of the cellular tissue, especially those having a tendency to suppurate. It relieves irritation, and checks determination of blood, and promotes the absorption of inflammatory exudations.

In furuncular diseases (boils), we have no remedy that equals lime water, unless it be the sulphide of calcium, and I prefer it in the majority of cases to this. The patient takes from a half to a wine-glass of fresh lime water twice or three times a day, and soon the tendency to "boils" passes away. It is an excellent remedy in some cases of scrofula, especially in scrofulous diseases of the skin, or scrofulous deposits elsewhere than in the lymphatic glands.

SULPHIDE OF CALCIUM.

Dose.—From the fraction of a grain to two grains.

Therapeutic Action.—For some two or three years the Sulphide of Calcium has been recommended as a remedy for boils, and other inflammations of cellular tissue and skin, terminating in suppuration.

I not only employ it as a "Job's comforter," and as a remedy in inflammatory disease of cellular tissue likely to terminate in suppuration, but in catarrhal disease with muco-purulent secretion, and in chronic diseases of the skin, especially with change of the epidermis, as well as pustular disease, or disease terminating in suppuration. It is a good remedy in some forms of secondary syphilis, with some of the symptoms above named.

It is an admirable remedy in some cases of catarrh, with profuse secretion, chronic pharyngitis, and in atonic laryngeal disease, with impairment of the voice. It is also a remedy to be thought of in disease of the lungs following pneumonia, where the deposit has not been wholly absorbed, and where there are small points of suppurative action.

CALCII CHLORIDUM.

Preparation.—Liquor Calcii Chloridum.

Dose.—From ten drops to one drachm.

Therapeutic Action.—Chloride of Lime, when taken in small doses, promotes the mucous, renal and perspiratory secretions, exerts a specific action over the lymphatic vessels and glandular system, promoting the activity, reducing swellings and indurations, thus exhibiting its resolvent and liquefacient powers. In large doses it causes nausea, vomiting, occasionally purging, with a quick pulse, præcordial anxiety, faintness, weakness, trembling and giddiness. In excessive doses it affects the nervous system, causing trembling of the limbs, contracted pulse, cold sweats, convulsions, paralysis, insensibility and death.

The diseases in which it has been mostly used are those of a scrofulous character, especially in those affecting the glands. Its action is that of a deobstruent and liquefacient or resolvent, for which purposes it is esteemed by many an excellent remedy. "It has been found most efficacious in the treatment of the tabes mesenterica, checking purging, diminishing the hectic fever, allaying the inordinate appetite, and in many cases ultimately restoring the patient to perfect health." It has been esteemed useful in goitre, arthritic affections, paralysis, and in other diseases when it is desirable to excite the absorbents. In goitre, scrofula and glandular diseases, it has been used both externally and internally at the same time. It was used externally dissolved in water in the form of a bath.

MINERAL ACIDS.

The Mineral Acids, elsewhere described, are frequently employed in chronic diseases and cachectic states of the system. In the mercurial, syphilitic, scrofulous, etc., they often afford much advantage; but the benefits derived from their exhibition depend more upon their tonic and restorative action upon the digestive organs, probably, than upon any alterative powers which they possess. They are used in chronic affections of the liver, internally and topically, in the form of the nitro-muriatic acid bath. They are employed as a tonic simply in many chronic diseases, and in the convalescent forms of acute affections, either alone or associated with bitter infusions.

BENZOATE OF LITHIA.

DOSE.—One grain three or four times a day in solution.

THERAPEUTIC ACTION.—This remedy may be employed in cases of chronic rheumatism and gout, and in disease in which there is enlargement of the joints, and puffy atonic and deep colored skin.

It will be remembered that certain mineral waters containing Lithia have had a great reputation in diseases of the urinary organs, and artificial waters containing it have been prepared. But until I used this, I have not had anything that was satisfactory.

I have used it in chronic nephritis and cystitis—cases in which there was abundance of the phosphates in the urine, with mucus and sometimes pus. In these cases there was great irritation of the bladder and urethra, with tenesmus and burning on passing water.

I have given this Benzoate of Lithia in grain doses three or four times a day, the powder being added to a glass of water. I think it is important to use it with water in this way; even the water is of advantage.

CHIONANTHUS.

THE BRAK OF CHIONANTHUS VIRGINICA.—U. S.

PREPARATIONS.—Tincture of Chionanthus.

DOSE.—From one to twenty drops.

THERAPEUTIC ACTION.—This remedy exerts a specific influence upon the liver and spleen, and blood-making organs, and when a wrong of blood-making is the cause of bad blood it may be used for the general purposes of an alterative. But it is especially a remedy in jaundice and biliary calculi. In doses of five drops every two hours, it may be given in any form of jaundice. When there is irritation of the liver, with increased temperature and hardness of the pulse, it will be associated with Veratrum or Aconite; when there is marked atony, with Nux, Leptandra, or Podophyllin.

In hepatic colic—gall stones—it is the most certain remedy of the materia medica. In some cases we will combine it with Nux, in others with Dioscorea, and in others with chloroform. In these cases the dose may be repeated every half hour.

We use it in chronic hepatitis, chronic splenitis, inflammation or other disease of the pancreas, and some cases of chronic gastritis. It may be employed in any cases showing yellowish discoloration of skin and eyes, with imperfect waste and excretion, with a prospect of advantage.

UVEDALIA.

THE ROOT OF POLYMNIA UVEDALIA—U. S.

PREPARATIONS. — Tincture of Uvedalia. Ointment of Uvedalia.

DOSE.—From two to twenty drops.

THERAPEUTIC ACTION.—Uvedalia has been recommended as a specific for the peculiar condition of the spleen known as "ague cake." For this condition, I think, there is no remedy of the materia materia so efficient. The tincture is given in doses of five or ten drops every three or four hours, and the abdomen is thoroughly rubbed with the ointment, and heat applied to promote absorption.

It is a valuable remedy in chronic inflammation of the liver, and in enlargements of this organ. In cases of imperfect blood-making with tumid abdomen, it has proven an excellent remedy. In chronic metritis with hypertrophy, in sub-involution of the uterus, in engorgement of the lower lobe of the lungs, and when inflammatory deposits have not been absorbed, it may be thought of.

I have used it in chronic disease of the joints, the tissues being full and doughy, with most excellent results. Indeed, I may say, that whenever we find a tissue full, inelastic and sodden, benefit may be expected from the thorough application of this remedy.

It is one of the best hair tonics in the materia medica, and if anything will stimulate growth, I think this may be depended upon. For this purpose I order Tincture Uvedalia ℥iv., Bay Rum ℥xij. Mix, and rub thoroughly once or twice a day.

BERBERIS AQUIFOLIUM.

PREPARATIONS.—Tincture Berberis Aquifolium.

DOSE.—From five drops to one drachm.

THERAPEUTIC ACTION.—This remedy slightly stimulates waste and excretion, and possesses the properties of the many other vegetable remedies classed as alteratives. It has been extolled and widely sold as a remedy for syphilis and scrofula, but it has not fulfilled the promises made for it.

Like many other things, it has had its day, and will probably pass into the list of unused medicines. If careful study should improve our knowledge of it, it will gradually find a place in this class.

GRINDELIA.

THE LEAVES OF GRINDELIA ROBUSTA.—U. S.

PREPARATION.—Tincture of Grindelia.

DOSE.—From the fraction of a drop to five drops.

THERAPEUTIC ACTION.—Grindelia is a stimulant to the nutritive processes, both in its general and local action. We have prescribed it with marked advantage in atonic ulcers (old sore legs), in scrofulous ulceration, and in some cases after sub-acute inflammation with cacoplastic deposit. In these cases the local application will be of the strength of ℥ij. to water Oj.: internally, one or two drops every three or four hours.

It has proven a fairly good remedy, in humid asthma, and in the asthma of corpulent and lymphatic people. In some cases it gives prompt relief, and occasionally effects a cure.

IODOFORM.

DOSE.—From one-half to two grains, in pill with extract of Gentian, or Hydrastine. As a local application it is dissolved in six to ten parts of ether.

THERAPEUTIC ACTION.—"Locally, Iodoform, as a dry powder, brushed lightly over the surface with a moistened camel-hair pencil, has been for three years my almost invariable treatment of venereal sores, especially the local chancre. During the last few months I have often substituted for the dry powder an ethereal solution (one part of iodoform in six or eight of ether). The sore is touched or dabbed with a pencil dipped in the ethereal solution, according to its size and depth, lightly or copiously. The ether quickly evaporates, leaving a thin pellicle of iodoform, that as effectually stays the spread and produces healing of chancres as does the more copiously applied dry powder. Thus the surface is covered more exactly, and the disagreeable smell of the iodoform, is too faint to attract attention. The sore is well washed with water and dried before the iodoform is applied, and the surface is lastly protected by a bit of dry lint. When the secretion is abundant, the dressing must be renewed twice daily, but in three or four days the amount of discharge becomes so scant that one dressing *per diem* suffices.

In this way venereal sores heal quickly. Pain subsides at once; the sore is well in a week or ten days, and the chances of consecutive inoculation or bubo are greatly lessened. In a very few cases, the application of iodoform gives momentary smarting, which is very bearable; even the ethereal solution does not hurt, and usually the patient declares the application to be quite painless. I avoid using iodoform on inflamed sores, or on simple granulating wounds; but indolent non-specific ulcers are rapidly improved by iodoform locally applied.

Lately, I have given iodoform internally with great benefit. It acts more rapidly than potassic or other iodides, and judging from experience thus far, it is as readily borne as are those salts. I have given it in one and a half grain doses as a pill with extract of Gentian. Three pills are given each day, increasing gradually till eight or ten pills are taken in twenty-four hours.

I have used it with excellent effects in cases of obstinate syphilitic ulceration of the tongue, where the dorsum is covered with rugged thickened epithelium, which is constantly splitting into deep fissures, and this causing continual severe pain to the patient. This affection is often quite insensible to mercury, alkaline iodides, or arsenic—the remedies usually beneficial. In three of these obstinate cases, where I had been treating the patients at intervals for years with the remedies just mentioned with little lasting benefit, iodoform pills have acted like a charm. Pain, immediately lessened, in two or three days ceased wholly; and the fissures healed rapidly, while the tongue soon shrank to its natural size."—*Berkeley Hill.*

THUJA.

THE LEAVES OF THUJA OCCIDENTALIS.

Preparation.—Tincture of Thuja.

Dose.—From the fraction of a drop to five drops.

Therapeutic Action.—Our Homœopathic neighbors think highly of this remedy, and in their provings it has 3370 symptoms, being a remedy for nearly all ills to which flesh is heir. We would restrict it, however, to cases where there were caco-plastic deposits in the superficial fascia and skin, or under the periosteum, or in which there is a tendency to warty growths.

It has been employed with advantage in the treatment of old ulcers, chronic skin disease with ulceration, and in some phases of secondary and tertiary syphilis.

Prof. Howe uses this tincture as an injection in the cure of hydrocele, and thinks it much better than tincture of iodine.

DIVISION V.

CLASS XII.

REVULSIVES.

Revulsives are a very important class of remedial agents, and are applicable in numerous diseases. Revulsion is undoubtedly a very important sanative influence of many internal remedies, as well as those which are applied to the surface with this object. As the term revulsive and its synonyms are ordinarily used with reference to local applications, we shall confine our remarks to their external employment in accordance with the general understanding of the term, and will only incidentally refer to the revellent influence of certain classes of internal agents, before closing this chapter.

Revulsives produce an exaltation of the vital manifestations of the parts to which they are applied. The principal object which the therapeutist has in view, when he applies this class of agents, is to produce a concentration of the vital energies upon external and less important parts, and thus relieve more important internal organs, that are in a state of congestion, irritation, or inflammation. They are derivatives or counter-irritants; they invite the vascular and nervous excitement to the surface, and thereby diminish the internal disease. It appears to be a law of the animal economy, that two points of irritation and fluxion can not exist at the same time; but that the stronger of the two should entirely relieve the weaker. We find that this is the case in the employment of these agents; if the irritation produced is greater than that at the seat of the disease, the brain will take cognizance of but the one point of irritation—and that is the one artificially produced; but if the artificial irritation is the weaker of the two, but little if any good results. This is undoubtedly the most important, but by no means the only influence exerted by this class of agents; as will be seen when we take up the different classes of revulsives.

In deep-seated diseases of important vital organs, we resort to these agents with a view of relieving the inflamed and engorged vessels by establishing a new point of irritation, stronger than the preëxisting one; the circulation is always determined to such a point as is expressed in the well-founded axiom, "*Ubi irritatio, ibi fluxus.*" This revulsive influence, or cutaneous excitation should be mild or severe, limited or extensive, according to the character of the disease which it is intended to relieve, and to the extent and importance of the part affected. Thus, disease of the lungs or liver would demand more vigorous counterïrritation than less important organs. When a surface as extensive as the pleura or peritoneum is involved in acute inflammation, feeble and limited applications would prove unavailing. Revulsion must be extensive and powerful, in proportion to the extent of surface inflamed, to the intensity of the diseased action, and to the importance of the organ or tissue involved. Speedy and intense counterïrritant agents, and slow and protracted means of the same character, are adapted to pathological states entirely dissimilar; the former to active and high grades of inflammatory excitement, the latter to the chronic phlegmasia.

It may be proper to say something respecting the relative importance of intermittent and continuous or permanent revulsion. Intermittent revulsion is more efficacious than continuous, the intensity of stimulation in the two cases being equal. The system does not become accustomed to intermittent counterïrritation; if the means are applied for a short time and removed, until its first influence is no longer experienced, and then reapplied, the same effects will follow its reapplication that it produced at first. Continuous revulsion may, however, exert a powerful influence by repeatedly removing the application and renewing it. Artificial irritation, when permanent, or long-continued, loses, to a great extent, its revulsive influence; it ceases to be an abnormal condition, and the point to which it is applied is no longer a center of fluxion; the derivative influence of the same agent exerts but a feeble influence after it has been long applied. This is especially the case with issues and setons. Though they may be kept open, and a discharge of matter be still maintained, yet they lose much of their revellent influence after they have been applied for a few weeks. The irritant, however, when constantly applied and frequently renewed, may keep up a constant influence, and the system will not become so accustomed to its action as to cause it to cease to be powerfully revulsive; thus, when the *irritating plaster* is applied, and not removed (excepting to renew it), for many weeks, or even months, it exerts a constant revellent influence, and does not lose its effects by long-continued application.

In all cases where we apply revulsives for the purpose of subverting inflammatory action, the object is to elevate the cutaneous organic action, or increase the vital manifestation in a contiguous part until it exceeds the internal morbid action. If the local stimulation, however, is excessive, —if super-excitation is established, instead of subverting the pre-existing morbid action, it may serve to increase it. It may do this by being situated in close proximity to the organ or part diseased, the excitation being transmitted by contiguity of tissue, or the super-excitation may injuriously affect the general system, cause excitement of the circulation, and thus increase the local disease.

Revulsives may with much propriety be divided into five classes. The names of these subdivisions imply the nature and extent of the revulsive influence upon the part to which they are applied. These classes are 1. *rubefacients;* 2. *epispastics* or *vesicants;* 3. *suppurants;* 4. *escharotics* or *potential cauterants;* and 5. *actual cauterants.*

I. *Rubefacients* are those revulsive applications which redden the surface by exciting an increased vascular and nervous influx to the point of artificial irritation; hence they may be termed *topical stimulants.* Experience has shown that when an internal organ is the seat of undue excitement, a similar excitement established in a contiguous part often relieves the pre-existing one. Rubefacients are any applications which redden the surface, as the mustard, capsicum, oil of turpentine, dilute aqua ammonia, liniments, essential oils, frictions, vapor of hot water or spirits, hot cloths, poultices, etc. The different agents of this class named, are adapted to different diseases; those that produce a speedy and powerful impression are adapted to acute cases; mustard, capsicum, hot applications, etc., are important in congestions and inflammations, while the milder agents are better suited to chronic affections.

These agents are employed as excitants in many cases of torpor of the system not connected with congestion or inflammation of internal parts. In coma they are exceedingly valuable as excitants, they often arouse the patient from that torpor and insensibility which is a very frequent concomitant of fever. In the advanced stages of fever, where the vital energies are rapidly sinking, or when a collapse has already occurred, rubefacients are sanative in the highest degree. Artificial and topical as well as internal and general stimulation is of unquestionable importance in sustaining the sinking powers of the system until reaction occurs and renders their further employment less important.

It is unnecessary to particularize, suffice it to say they are highly valuable in all forms of congestive or inflammatory fever, in adynamic fevers, and in the sinking stages of all forms and types; in the phlegmasia in general, they are indispensable therapeutic agents; in apoplexy they stand pre-eminent; in deep-seated neuralgia, in all congestions, inflammations or undue determinations to any organ or tissue of the body, if actively and efficiently used they supersede the use of the lancet, as well as other modes of counter-irritation, as blisters, etc., as well as the necessity of using so much medicine. They have also proved important in arresting hemorrhage; sinapisms applied to parts antagonistic to the one from which the bleeding occurs will often stop it entirely.

II. *Epispastics* or *vesicants* may cause redness, inflammation, vesication or blistering, suppuration, and in some cases sloughing, when applied to the surface of the body. Their effect on the skin is greater than rubefacients, as ordinarily applied; they cause an excitement of the capillary circulation, and an effusion of serum beneath the epidermis, or a blister. Vesicants exert their sanative powers mostly as revulsives, though they also act as *topical depletives*, and as stimulants. They produce a more lasting derivative influence than rubefacients, and in this respect are superior to them in many cases as revulsives. Generally, rubefacients are not properly applied, or their influence is not maintained for a sufficient length of time; being more painful than blisters, more speedy and transient in their effects, only a temporary and, in many cases of acute inflammation, limited advantage is gained by their employment, although they are capable of exerting even a much stronger revulsion than blisters. The advantage gained by a blister is not lost because the influence is continuous; when it is important to maintain permanent counter-irritation, and when the physician sees that a blister is applied, he feels that he has insured his object; whereas, if he depends upon the nurse to make the necessary revulsion, by the application of rubefacients, he has no assurance, if the case is important, that his measures will be properly and efficiently carried out. If the patient complains of pain, the nurse removes them; does not reapply them, or makes them too weak, or not large enough; keeps them on but a short time, or acquiesces, if the patient refuses to have them applied, though it may cost his life, and the reputation of his medical attendant.

Vesicants, however, should never be substituted for rubefacients when the latter agents will prove sufficient; for they are quite as efficient generally, if properly employed, and are less objectionable, blisters being much more apt to cause sloughing or gangrenous ulcers.

Epispastics are employed in the secondary stages of almost all inflammatory diseases. If applied during the high grade of excitement, or before proper antiphlogistics have been premised, they not unfrequently augment the inflammation. The same remarks apply to their employment in fever; if applied during the period of exacerbation, they increase the fever; if early resorted to as revulsives, they should be applied during the declining stage or period of remission. If, however, congestion or inflammation of some important organ exists that may endanger life, they may be employed early, without regard to the stage of excitement. Vesicants are adapted to protracted acute disease, and rubefacients to those that run their course more rapidly; both modes of revulsion may often be resorted to in the same case.

In erysipelas the advantages of vesicants are very conspicuous. They are supposed by some to act as excitants to the inflamed capillaries, thereby setting up a new action in them. By others they are supposed to act as *topical depletives;* they may exert a salutary influence in both ways, but the principal advantage is undoubtedly gained by relieving the engorged capillaries of their contents, thus giving them an opportunity to regain their normal condition.

Occasionally we meet with acute diseases, in which there is great prostration; but that prostration is more apparent than real. This is particularly the case in diseases of a nervous character. This apparent debility is often dependent upon congestion of some vital organ, by the application of a blister, or even a sinapism; we relieve the oppressed organ by freeing its engorged vessels, and the weakness is gone. Vesicants have occasionally proved of great advantage in protracted fevers, unattended by any local disease; no fixed point of irritation exists, yet the excitement is regular in its recurrence. In such cases a blister often speedily arrests the abnormal condition; it seems to give an increased impulse to the recuperative powers of the system, and it would also appear to act by localizing the excitement, thus breaking the chain of morbid associations and perverted sympathies. The blister is a new secreting surface, toward which the nervous and vascular afflux is directed, and the general excitement soon subsides.

In some cases an erysipelatous inflammation follows the application of a blister, which eventuates in gangrene, and in some cases produces a fatal result. In many of the eruptive diseases, and in adynamic diseases generally, blisters are very apt to cause gangrene and sloughing, owing to the want of vitality in the system to resist their action.

Epispastics should rarely, if ever be used in the diseases of children, especially when young; for at this age there is a peculiar susceptibility of the nervous system to all irritants; and they not unfrequently aggravate the general disease, and may even produce spasms and the death of the child.

III. *Suppurants* form the third subdivision of revulsives, and produce a still more intense degree of inflammation than epispastics. Their influence sometimes extends to the subcutaneous cellular tissue. They are much slower in producing their influence upon the parts to which they are applied than rubefacients or vesicants (if we except the issue), and are consequently adapted to chronic diseases. They are applied as permanent revulsives, as well as for the purpose of securing a copious discharge of matter. By establishing a constant drain, we insure a continuous determination of blood to the part to supply the demands of the new secreting surface. Among this class of agents may be named the *irritating plaster*, an exceedingly valuable application. Some use the tartrate of antimony, in the form of ointment or in solution, for the same purpose; but we object to its use for reasons which will hereafter be assigned. The seton is an example of the subdivision under consideration; as is also the issue, though it is usually commenced by the application of an escharotic. Irritating ointments, as the savin ointment, nitric or sulphuric acid ointment, etc., act in a similar manner. The system becomes habituated to the use of the *issue* and *seton*, and in consequence of their permanency they are found less efficient than intermittent revulsives, or even those kept constantly in contact with the part, as the irritating plaster.

Suppurants are resorted to mostly in the chronic phlegmasia. In many inveterate pulmonary affections, chronic hepatitis, nephritis, peritonitis, sciatica, lumbago, neuralgia, ophthalmia, articular inflammation, disease of the brain, etc. Their influence is most apparent when purulent matter is freely discharged.

IV. *Escharotics* or *potential cauterants* act chemically; they disorganize or destroy the vitality of the part to which they are applied. They are used to form eschars, issues, or artificial ulcers; in this way they act as suppuratives, and are employed in many chronic diseases as counter-irritants. They are mostly used, however, to destroy morbid growths, cancer, tumors, to remove the callous of fistulous pipes, etc.

V. The *actual cauterant* is any mode of applying heat enough to derange or disorganize a part. The incandescent iron, the moxa, heated vapor, hot water or other fluids, all act as actual cauterants. These agents act rapidly, and they are therefore resorted to when a very powerful and speedy impression is demanded. They are applied in cases of deep seated pains that resist milder revellents; in neuralgia they are supposed to prove beneficial by suddenly abstracting the nervous energy from the nerve affected. They are also applied to bleeding vessels to arrest hemorrhages, to destroy morbid growths, etc.

SINAPIS.

The action of mustard as an internal remedy, having been described under the head of Stimulants, we have but to speak of its topical application as a means of producing revulsion. For this purpose it is one of the most important agents in use, no agent with which we are acquainted being as certain, safe and prompt a rubefacient and topical stimulant.

It is much employed in all inflammatory visceral affections, as pneumonia, pleuritis, gastritis, hepatitis, hysteritis, peritonitis, etc., as a means of producing revulsion to the surface, and thus relieving the inflamed organ. In febrile diseases, attended with local congestions or inflammation, it is found to prove beneficial by producing a new point of excitement, thus equalizing the circulation. In low fevers, attended with torpor, coma, local congestions, etc., and in all diseases in which there is a manifest loss of nervous energy, in apoplexy, delirium, and poisoning by the use of opium or other narcotics, mustard cataplasms, by stimulating the nervous system, preventing congestions, etc., are found to be important adjuncts to the treatment. They are likewise valuable in the sinking stages of disease for their stimulating influence over the circulation, aiding as they do in establishing permanent reaction.

The Sinapism or mustard cataplasm, is often made with boiling vinegar, which is not the proper mode to prepare it, as both heat and acids counteract its stimulating and rubefacient action by impairing or destroying its acrid qualities. It should be mixed with either cold or tepid water, and when speedy revulsion or stimulation is not required, the pulverized mustard may be mixed with an equal proportion of corn-meal, rye-meal or wheat flour. When applied to the extremities or any part of the surface, it usually soon produces redness with a burning pain, which becomes intense if permitted to remain in contact with the surface for any considerable length of time. The size, strength, continuance and repetition of the sinapism should be determined by the extent, duration, and intensity of the disease, and by the physiological importance of the organ diseased. In cases of diminished sensibility, as in apoplexy, paralysis, typhoid and comatose states of the system, care should be taken lest by the too long application of the agent vesication, obstinate ulceration, or even sphacelus may follow. For purposes of rubefaction, the flour of the black mustard is to be preferred to the white.

In cases of violent neuralgic pains, acute peritonitis, and other deep-seated painful and alarming diseases, the oil of turpentine or tincture of capsicum is sometimes first applied to the surface or added to the sinapism, in order to increase its excitant and revellent action.

OLEUM SINAPIS.

The *volatile oil of mustard* is powerfully acrid and rubefacient, and is capable of inducing speedy vesication. The vapor which it exhales is exceedingly pungent, causing a copious flow of tears and violent sneezing. When applied to the sound skin, it produces a violent burning sensation, with intense redness and vesication. It has been considerably used in Germany as a vesicatory.

As a rubefacient thirty drops should be dissolved in a fluid ounce of alcohol, and rubbed over the affected part, or strips of linen should be dipped in it and applied to the skin, and allowed to remain until dry; or six or eight drops may be mixed with a fluid drachm of either olive or almond oil, and used in the same way. The strength of the application and the mode of employing it, should be determined by the thickness of the skin and the normal or diminished sensibility of the surface. It has been mixed with mucilage of gum arabic or some demulcent, and taken in doses of one-sixth of a drop in cases of colic. In over-doses it acts as an acrid poison, producing gastro-enteric inflammation.

CAPSICUM.

Cayenne Pepper, fully described under the class of Stimulants, is a valuable rubefacient and topical excitant. For this purpose the powdered capsicum may be applied as a poultice, or sprinkled upon emollient cataplasms, or upon the mustard sinapism when a more pungent or certain rubefacient is required. In cases of extreme torpor, as in cases of deep coma occurring in the advanced stages of typhus fever, when the mustard proved unavailing, we have found the Capsicum an important auxiliary. The tincture may be applied by means of friction to the part previous to the application of the mustard or some other cataplasm, or it may be simmered in vinegar and that applied, or it may be mingled with the mustard.

It often affords much relief in rheumatism, neuralgia, and local inflammatory affections. It is a certain and speedy rubefacient, devoid of the danger of producing deep-sloughing ulcers when applied as a derivative and topical excitant, as is the case with the mustard in cases of great insensibility.

ARMORACIA.

Horseradish is often used as a rubefacient, the scraped or grated root being applied to the feet and ankles, wrists, etc., as a revulsive in cerebral congestions, apoplexy, phrenitis, etc. In cases of local inflammation it is employed as a revulsive. When applied to the surface, it causes rubefaction and intense pain, and if permitted to remain on for any considerable length of time, vesication may result from the prolonged contact.

The bruised or grated roots and wilted leaves are applied as draughts to the feet in febrile diseases.

LIQUOR AMMONIÆ FORTIOR.

This solution of Ammonia acts promptly as a rubefacient, vesicant and caustic. It is too strong for use without a reduction; it is employed as a rubefacient and vesicant in the form of the Linimentum Ammoniæ Compositum, and Dr. Gondret's Vesicating Ammoniacal Ointment, which see under the division of vesicants.

LIQUOR AMMONIÆ.

The antacid, stimulant and sudorific properties of the Aqua Ammoniæ have been noticed elsewhere. Its rubefacient action remains to be considered in this place. It is an active rubefacient, and as such is employed in deep-seated rheumatism, in neuralgia, deep-seated pain and inflammation, spasm of the stomach or bowels, cramps in the extremities, local pains, sprains, bruises, etc., in the form of the Linimentum Ammoniæ or Linimentum Ammoniæ Compositum. Aqua Ammoniæ acts locally as a corrosive irritant, causing redness, vesication, or even ulceration or an eschar, if the strength of the solution and duration of contact be sufficient to cause these latter effects On account of its speedy action as a vesicant, it is occasionally employed in sudden attacks of inflammation of internal organs, the result of retrocedent gout.

Linimentum Ammoniæ.—Solution of Ammonia ℥j.; Olive Oil, ℥ij. Mix. This is a popular rubefacient, much used in local inflammatory diseases, as angina, rheumatism, neuralgia, etc. It is to be applied by gentle friction, or by means of flannel saturated with it and placed upon the affected part. The Dublin College directs equal parts of each.

OLEUM TEREBINTHINÆ.

Oil of Turpentine merits a passing notice under the division of rubefacients, although its general properties have been discussed under the head of Stimulants. It is a valuable local application in a great variety of cases. Neuralgia, chronic rheumatism, angina, gout, deep-seated painful affections, pleurisies, puerperal peritonitis, enteritis, etc., are a few among the many diseases in which the turpentine proves a valuable rubefacient.

Rubbed either hot or cold upon the extremities in febrile diseases of an adynamic kind, it contributes much toward arousing the organic actions, localizing the excitement, and restoring the patient to a state of consciousness.

OLEUM CAJUPUTI.

The Oil of Cajuput, already described, is a valuable topical stimulant and rubefacient in chronic rheumatism, neuralgic pains, sprains and deep-seated painful affections. When combined with sweet oil, it constitutes a valuable application in parotitis and other cynanchial affections.

When applied to a carious tooth it often affords relief in cases of toothache. It is useful in paralysis, employed both as an internal agent and locally.

It possesses powerful antispasmodic qualities; it is also a diffusible stimulant and sudorific.

For a further description of its therapeutic uses, the reader is referred to Antispasmodics

OLEUM MONARDÆ.

The Oil of Monarda, elsewhere noticed, acts powerfully as a rubefacient, quickly inducing heat, redness, pain, and even vesication. It has been employed in typhoid fevers, congestive and inflammatory conditions, cholera infantum, rheumatism, deep-seated pain, spasm of the bowels, etc., when an active rubefacient is required. For ordinary purposes it should be diluted with sweet oil, alcohol, or some other agent, before it is applied to the surface.

The Oleum Cinnamoni (Oil of Cinnamon), Oleum Piperis (Oil of Black Pepper), Oleum Mentha Piperita and Viridis (Oils of Peppermint and Spearmint), Oleum Rosmarini (Oil of Rosemary), Oleum Hedeomæ (Oil of Pennyroyal), Oleum Lavandulæ (Oil of Lavender), Oleum Sassafras (Oil of Sassafras), Oleum Succini (Oil of Amber), Oleum Gaultheriæ (Oil of Wintergreen), Oleum Caryophylli (Oil of Cloves), Oil of Hemlock, and some other essential oils not enumerated in the foregoing list, are occasionally employed as rubefacients. They are combined together, with camphor, alcohol and other substances, and are applied to the surface in rheumatic and neuralgic affections, local painful disorders, etc. Some of them are very efficient rubefacients.

ÆTHER SULPHURICUS.

Sulphuric Ether, when applied to the surface, acts as a rubefacient, if evaporation be repressed, and even vesicates in some cases; it also acts as a refrigerant, when applied to the surface, being mostly employed to produce cold by its speedy evaporation. For this purpose it is applied to strangulated hernia to facilitate its reduction, and upon the head in cases of headache, and in inflammatory and congestive states of the brain. When applied to the surface, and the parts quickly covered with a compress, it acts as an irritant, producing redness and a highly excited state of the superficial capillaries, and if long-continued vesication follows. When applied with friction, it acts as a topical stimulant.

Its general properties are described under Stimulants.

ALLIUM.

Allium Sativum, or Garlic, already described, is applied to the surface as a topical irritant, rubefacient and revulsive. It is mostly applied to the feet in diseases of the head or thorax. It is sometimes applied as an antispasmodic embrocation in infantile convulsions, its juice being combined with olive oil or some other agent, or it may be simmered in dilute alcohol.

It is also employed as a resolvent to indolent tumors, and the juice sometimes dropped into the ear in cases of earache.

ALLIUM CEPA.

The Onion in its effects upon the system is similar, though milder than garlic. It is much prized as a mild esculent vegetable,-its acrid volatile oil being dissipated by boiling.

The raw onion is applied to the feet as draughts. It is also applied as a poultice in cases of the bite of the rattlesnake, it being believed to possess antidotal qualities. The roasted or boiled onion constitutes a valuable poultice, applied to suppurating tumors, local inflammations, in cynanche, earache, suppression of urine, etc.

CALORIC.

Heat when applied to the surface, at a temperature of from 120° to 150° Fahrenheit, acts promptly and powerfully as a rubefacient. Pediluvia, semicupia, fomentations, heated vapor, etc., act efficiently as revulsives. Mustard, salt, and sometimes other stimulants, as alcoholic liquors, are added to the water to increase its topical excitant action. In deep-seated pain, either neuralgic, rheumatic, or spasmodic, heat often affords great relief by its active derivative powers. A great increase of nervous and vascular excitement takes place to the part to which it is applied, consequently the pain and local inflammation abate. Either dry or moist heat, when applied to the surface, acts as a general excitant, and is adapted to the relief of depressed states of the vital forces, internal venous congestions, etc.

FRICTIONS.

Friction with the flesh-brush, coarse towel, dry hand, etc., exercises an important derivative influence in many diseases, both of an acute and chronic character. It often proves highly serviceable in dropsies by promoting absorption. In glandular enlargements, indolent tumors, rheumatism, neuralgia, dyspepsia, and in many other instances, it proves eminently serviceable by virtue of its derivative power, and by changing morbid action existing in the vessels of the parts diseased, and by exciting them to a new action, and also by promoting that of the absorbents. Much of the benefit ascribed to the use of various embrocations is dependent upon the friction employed in its application.

CUPPING.

Dry cupping is one of the most important revulsives in many cases that can be named. It acts promptly and powerfully as a derivative, causing speedy rubefaction. The capillaries of the part to which the cups are applied become speedily injected, thus clearly showing the therapeutic value of the application. Dry cupping is particularly indicated in deep-seated congestions—in abdominal or thoracic, and likewise in cerebral; it is also an effectual mode of relieving visceral inflammations. In abdominal and portal congestions occurring in fevers, the relief which we have often seen immediately follow the application of cups is truly surprising. Ophthalmia, phrenitis, pleuritis, pneumonitis, hepatitis, nephritis, etc., are among the phlegmasial diseases in which the use of dry cups will be found useful.

Dropsical effusions and hypertrophied organs or parts, are often relieved by their employment. In rheumatism, deep-seated neuralgia, and many other affections of a local character, they are advantageously employed.

The use of the scarificator, associated with the cupping, is a therapeutic measure of still greater efficiency in many cases; possessing, as it does, all the derivative powers of the former, with the topical depletive effects of the latter. By this process the capillaries of the inflamed or congested parts, or those contiguous, are unloaded, and undue repletion counteracted. It is a measure of great efficacy in local inflammations and congestion. It is appropriate in all the cases to which dry cupping is applicable. It is often of great utility in old indolent and callous ulcers, for removing the indurated state of the ulcer, by breaking up and promoting the absorption of the callous structure, and by exciting the vessels involved in the ulcerative process to a renewed and healthy action. In this way some of the most obstinate and protracted ulcers are relieved in a short time, very simple dressings being all that are required to complete the cure; and in other cases, compresses may be applied and kept constantly wet with cold water as an additional curative measure.

In cases of local poisoning by the bite of a rabid animal, rattlesnake, etc., an immediate resort to the scarificator and cups affords a fair prospect of relief. To be beneficial it must be resorted to before the poison has been absorbed into the system. In disordered states of the spinal cord, dry cups or cups conjoined with the use of the scarificator, are often available; and in many chronic affections, such as enlargements or indurations of the liver and other similar diseases, the employment of the scarificator and cups, preceding the application of the irritating plaster, will be found to contribute much to the speedy and efficient action of that important application.

ACUPUNCTURE.

Acupuncture consists in the introduction of polished sharp-pointed needles into the muscular tissue. The needles are to be headed with sealing-wax, in order to give the operator better control over them, when they are to be rotated between the thumb and finger, at the same time making pressure so as to gradually introduce them from half an inch to one inch into the muscular structure, where they are allowed to remain from twenty minutes to one hour. In this way from three or four to half a dozen may be inserted at the same time. The needles are sometimes medicated before introducing them by dipping them into a solution of the salts of morphia, extract of Aconite, Hyoscyamus, etc.

Acupuncture acts as an especial and powerful excitant, derivative or revellent. It is employed in lumbago, sciatica, rheumatism and deep-seated chronic affections; also in nervous disorders, such as spasmodic and convulsive diseases, asphyxia, paralysis, amaurosis and other forms of neurosis, etc. In many other chronic affections of a kindred character, when the object is to produce a special excitant and revellent influence, acupuncture is employed with advantage.

PIX ABIETIS—PIX BURGUNDICA.

Burgundy Pitch is applied to the skin as a topical stimulant or gentle excitant and rubefacient. It causes a slight inflammation, which may be attended with serous effusion without vesication. It is said sometimes to occasion vesicular eruptions and even severe poisoning, followed by violent pain, tumefaction, redness and even ulceration. It is employed mostly in slight chronic affections, as in pain and weakness in the chest, side, back, loins, etc., and to the joints in articular diseases of a chronic character, chronic rheumatism, etc. When long employed it acts as a feeble counter-irritant and revulsive.

Emplastrum Picis.—Pix Burg. ℔iss., Resin and Beeswax, of each, ℥ij., Oil of Mace ʒss., Olive Oil ℥j., water ℥j.; liquefy the pitch, resin and wax, with a gentle heat; add the other articles; mix, and boil to a proper consistence.

This plaster acts as a stimulant and rubefacient, and is applicable in chronic pectoral affections, chronic disorders of the liver, chronic rheumatism, etc.

Emplastrum Picis cum Cantharides.—Pix Burg. ℔iijss., Cerate of Spanish Flies ℔ss.; melt together by means of a water-bath, and stir constantly while cooling.

This is an excellent rubefacient, more active than the Burgundy Pitch, and applicable to all cases requiring the use of a topical excitant and rubefacient, as rheumatism, catarrh, asthma, phthisis, hepatitis, and the sequelæ of pneumonitis and pleuritis.

PIX CANADENSIS.

The Pitch furnished by the Hemlock Spruce of the United States is often employed as a plaster in the same cases in which the Pix Burgundica is used. It acts as a gentle rubefacient and topical excitant. It is used in chronic pulmonary affections, chronic hepatic diseases, lumbago, and in many other cases requiring the use of gentle stimulating and rubefacient applications.

It is frequently applied to weak parts as a strengthening plaster: its utility, however, depends upon its excitant and rubefacient action.

RESINA.

Rosin, or common resin, is much used in the formation of plasters and ointments, which it renders highly adhesive and slightly stimulant. It is the principal ingredient in numerous stimulating, rubefacient and adhesive plasters.

Other agents, as capsicum and soap, are often associated with it when used as a plaster, in order to increase its topical excitant action. The various plasters used, said to impart strength in cases of local weakness, afford benefit by their rubefacient and topical excitant action.

ACIDUM ACETICUM.

Acetic Acid, applied to the skin, acts as a rubefacient and vesicant. Equal parts of Acetic Acid and water, applied on linen or cotton, will act as a rubefacient. Heated vinegar is often applied to the surface as a rubefacient, although much less efficient than the acetic acid.

ACIDUM NITRICUM.

Nitric Acid, when diluted with six or eight times the quantity of water, and applied to the surface, excites rubefaction, and has been used for that purpose in cholera, spasm of the stomach and bowels, and in other cases requiring active revulsives.

ACIDUM SULPHURICUM.

Sulphuric Acid may be used like the nitric to cause rubefaction. It should be largely diluted, lest its causticity be so great as to cause vesication, or even ulceration.

EPISPASTICS.

Epispastics, or Vesicants, are those topical applications which cause rubefaction when applied for a limited time, inflammation and vesication when longer applied, and if the duration of the application be sufficient, suppuration or sloughing of the cutaneous surface may follow.

CANTHARIS.

THERAPEUTIC ACTION.—Cantharides are vesicant, rubefacient, stimulant, irritant, diuretic, and emmenagogue. When swallowed they act on the gastro-intestinal membrane as an irritant poison; if the quantity be sufficiently great, causing inflammation of the mucous membrane, with constriction and difficulty of swallowing, and even an arrest of the process of deglutition. A burning pain in the stomach, nausea and vomiting follow, with tenderness of the abdomen, violent griping and purging, the stools being bloody, with ptyalism. They affect prominently the urinary organs, causing nephritis, cystitis, and urethritis, with pain in the hypogastric region and loins, a constant and urgent desire to void urine, with inability or great difficulty of doing so, the urine passing drop by drop, priapism in the male, perhaps satyriasis, and in the female heat and irritation of the genital organs, and in some cases abortion.

Applied to the surface they occasion heat, pain, redness, with serous effusion and vesication. If long continued, or if the vital powers be weak, as in typhoid conditions, ulceration and even gangrene often follow. Gangrene is quite liable to follow their application in exanthematous diseases, particularly in measles.

As internal agents, cantharides are exhibited with a view to their specific action on the urinary organs.

Passive dropsies, diabetes, paralysis of the bladder, incontinence of urine, are diseases in which they occasionally afford advantage. They are employed for their specific excitant action upon the uterus, in amenorrhœa dependent upon a torpid state of the uterine vessels. In some cases abortion follows their use. They are also prescribed for their aphrodisiac powers, for which they enjoy some repute.

To produce rubefaction, the common vesicating plaster may be applied for a limited time and then removed, or the tincture may be combined with soap or camphor liniment. These applications are employed in paralysis, neuralgia, rheumatism, numbness, and insensibility, to excite the skin and arouse the sensibility, as well as for their revellant action. Used in the manner stated, the plaster is often of much utility in the inflammatory diseases of children. As a vesicant, no agent of the materia medica is so much used, nor is there any one so available under all circumstances as the Cantharides.

Blisters afford relief, it is believed, principally by their derivative action. We can not, however, yield the position that they do not afford, in many instances, great benefit by their topical depletive action. By establishing a new secreting surface, and by keeping up a constant drain from the neighborhood of affected parts, it is believed the discharge itself, independent of the revellent action, will do much toward relieving the engorged vessels of the affected region, and thereby promote a new and healthful action in the diseased parts.

As derivatives, blisters are esteemed important in a great variety of diseases, by creating an afflux of the nervous energy and circulating fluids to the seat of their immediate action. In this manner they relieve irritation or inflammation of the internal organs. They are much used in both acute and chronic inflammations. In inflammatory diseases they are not applicable (unless it be in cases of emergency) until after the activity of the excitement has been subdued by appropriate means, such as purgation, diaphoretics, ablutions, etc.

RANUNCULUS BULBOSUS.

Crowfoot, if swallowed in its recent state, is a powerful acrid, causing severe pain and inflammation of the stomach. It is not used, however, as an internal agent. Applied to the surface it causes inflammation and vesication, for which purpose it was much used previous to the introduction of the Spanish fly into general use. The uncertainty or inefficiency of its action in many cases, and the severity with which it acts in others, causing, as it does, extensive inflammation, followed by deep and obstinate ulcers, has banished it from general practice.

JUGLANS.

The medical properties and uses of the Butternut have been elsewhere fully described. The active powers of the inner bark as a rubefacient and vesicant justly entitle it to a special notice in this place. The finely scraped inner bark, the bark being quite fresh, applied to the surface, will act promptly and efficiently as an epispastic. The parts being previously rubbed with heated vinegar will greatly facilitate the action of this as well as other vesicating agents. It may be necessary to moisten the bark if it does not possess a sufficient degree of moisture.

MEZEREUM.

The medical properties and uses of the bark of Mezereon have been fully described in another part of this work. In this place we shall extend to it but a passing notice as a topical agent. Mezereon is endowed with a high degree of acridity, and when applied to the surface in its recent state, it is followed by redness, irritation, inflammation, and vesication, for which purpose it has been used in the southern parts of Europe from time immemorial. The dried bark acts in a similar manner, but it is less active.

ANTHEMIS.

Anthemis Cotula, or May Weed, when bruised and applied fresh to the skin, occasions redness, inflammation, and in some cases vesication and even ulceration. It is to be confined to the surface by means of a compress. Even fomentations of the article occasion the same results in cases of great susceptibility of the skin to the action of acrids. It is seldom used for purposes of the kind. In cases of emergency it may be employed as a derivative.

DIRCA.

The bark of Dirca Palustris, Leatherwood or Moosewood, is said by Edwards and Vavasseur, in their "Manual of Materia Medica," to act as an epispastic, when applied to the skin. Others make mention of its possessing the same properties, but say it is slow to act.

SUPPURANT REVELLENTS.

Suppurant Revellents are those topical applications whose effects extend to the sub-cutaneous tissues; in other words, they occasion a deeper inflammation than blisters. They establish a permanent or more protracted revulsive impression and produce and maintain a purulent discharge from the part to which applied; such is the case with the Perpetual Blister, Irritating Plaster, Croton Oil, Setons, Issues, etc., although the latter consists in a slough or eschar formed by the application of escharotics or the potential cautery, to be noticed under the next division of Derivatives. Although formed by the use of the potential cauterant or escharotic, yet, in its effects, it acts as as a suppurant revellent.

EMPLASTRUM PICIS COMPOSITUM.

℞ Tar ℔iij., Burgundy Pitch ℔jss., Gum Turpentine, ℔j., Podophyllum, Sanguinaria, Arum, Phytolacca, *aa.*, ℥x. Boil the tar for half an hour; then add the pitch and turpentine, previously melted and mixed; remove from the fire, and add the other ingredients finely powdered, stirring until thoroughly incorporated.

In using it, it is warmed and spread with a knife or spatula upon soft leather, and is applied warm, so that it will adhere. It is usually renewed once a day until suppuration is established; if much inflammation is produced, the plaster is removed, and the parts covered with a cloth oiled, or spread with a simple cerate or cataplasm of ulmus fulva, or bread and milk may be used. Water is never applied to the suppurating surface, the pus being removed by using a soft cotton cloth.

Of all the suppurating modes of revulsion, none, so far as our acquaintance extends, bears more than a feeble comparison to the agent which heads this article. Although it may not act so early after its application as some other agents in use, yet the permanency and efficiency of its action, and its great alterative, derivative and topical depletive powers render it justly one of the most important therapeutic measures to which the physician can resort in an extensive train of chronic inflammatory affections.

In some instances it requires the renewal of the plaster from day to day for several days before the desired action upon the part is manifested. When it acts, it causes superficial inflammation, establishes a new secreting surface, which discharges large quantities of purulent fluid.

In chronic bronchitis, chronic laryngitis, catarrhs, phthisis, chronic hepatitis, splenitis, nephritis, etc., as a derivative and permanently sanative agent, it is unsurpassed, if, indeed equaled, by any other agent, whether topical or general. Its influence is positive and unmistakable in most cases. It acts powerfully as a derivative; its influence extends to deep-seated parts, modifying the action of the capillaries, thus subverting morbid action, and consequently subduing disease. In chronic peritoneal inflammation it is a valuable remedy. In visceral enlargements or indurations, chronic glandular diseases, chronic articular rheumatism, and in indurations and enlargements of the ligaments of joints, etc., its value is great. It acts not only as a derivative and suppurant, but also as a resolvent and discutient. Much of its utility in chronic pectoral and visceral disorders arises undoubtedly from its alterative influence upon the system, its active principles being absorbed into the circulation. It requires no great stretch of the imagination to believe that the active principles of agents so potent as those entering into its composition are capable of exerting a powerful alterative influence upon the different tissues of our bodies when a morbid condition exists.

If the surface becomes very irritable, highly inflamed and painful, emollient poultices, cloths imbued with mucilages, sweet oil, mild ointments, or salves may be applied until the irritation is lessened, when the plaster may be applied again. The dimensions of the plaster should in all cases correspond with the extent of surface or importance of the organ involved in diseased action

FONTICULI, OR ISSUES.

An Eschar or Slough is formed by the application of either the actual cauterant, escharotics, or potential cauterants. The caustic potassa is probably more frequently used for this purpose than any other agent belonging to the division of potential cauterants or escharotics. It combines chemically with the fibrin and albumen of the part by virtue of its affinity for those elements, and consequently causes disorganization by destroying the vitality of the animal fiber. Other caustic or escharotic agents may be used to accomplish the same end, as we shall state when we come to notice the next division of revellents or potential cauterants. Though formed by escharotics, yet the issue in effect is a suppurant revellent.

Issues are also formed by the application of a small blister to a given part, and upon the blistered surface a small round ball or irritant substance is confined by means of a compress and roller in order to maintain constant irritation and induce suppuration. For this purpose the small green fruit of the orange, known as the orange berries (*baccæ aurantii* or *issue peas* of the shops), after being dried and smoothed in a lathe, are employed. A small section of the Iris, Acorus, or Phytolacca, may be used for the same purpose. Their curative powers depend upon their protracted derivative influences, and upon the discharge of purulent matter.

Next to the irritating plaster we esteem the issue the most important and valuable of the suppurative revellants. Although its formation occasions intense pain, yet the pain is less, taking the whole course, than that resulting from the irritating plaster and most other agents. It is a powerful measure of revulsion. In chronic ophthalmia an issue upon the nape of the neck is often productive of great good. In chronic pectoral disorders, enlargements or indurations of the abdominal viscera or other organs; in chronic rheumatism, sciatica, hip-joint disease, white swellings, caries of the vertebræ, neuralgia, etc., we have found issues among the most important curative measures. Apoplexy, epilepsy, chorea, spasmodic asthma, phthisis, hepatitis, etc., are benefited by the discharge of pus as well as derivative action. By the conversion of an old obstinate or indolent ulcer into an eschar, a cure is often effected. As a measure of revulsion, the issue is beneficial in diverting excited or morbid action from parts affected. When the discharge from ulcers that have been open for a long time is checked, or when chronic eruptive diseases have receded to internal organs, an issue is important for the purpose of establishing an artificial drain, as well as derivative action, as a substitute for that which has ceased to exist. For directions for forming issues, see Caustic Potassa under the next division.

OLEUM TIGLII.

Rubbed on the surface, Croton Oil causes rubefaction, and a vesicular or pustular eruption, and in some instances an erysipelatous swelling. Owing to the pustular eruption which it occasions, it is employed as a suppurant revellant to relieve diseases of internal organs. It is often employed in diseased states of the respiratory mucous membrane, as phthisis, chronic bronchitis, laryngitis, asthma, pertussis, aphonia, glandular swellings, rheumatism, gout, neuralgia, spinal irritation, otalgia, chronic hoarseness, and sundry other chronic affections. Although sometimes used without dilution, it is more frequently combined with other agents, it being mixed with twice or thrice its volume of alcohol, ether, soap liniment, turpentine, olive oil, or some other suitable vehicle. It may cause purging, which is an objection to its use. It is mild and somewhat uncertain as a suppurant revellant, and possesses no advantages, indeed is far inferior to the common irritating plaster, as well as other agents belonging to this class. In infancy or childhood it possesses the advantage of being less severe than some other suppurants, but in other respects it is inferior to them.

PERPETUAL BLISTER.

The Perpetual Blister consists in the re-application of the ordinary blistering cerate, from time to time, so as to maintain a constant and protracted discharge. The same result may be secured by dressing the blistered surface with an ointment made of the Cantharides in reduced quantity, or by dressing it with the Savin ointment. This is a mild but quite efficient mode of maintaining a derivative action, and well adapted to the relief of chronic pleuritis, peritonitis, hepatitis, bronchitis and other chronic inflammatory affections, such as rheumatism, gout and neuralgia. In thickening and indurations of the ligaments and tendons of joints, and in hydrops articuli it is often quite beneficial.

SETACEUM.

The Seton is made by passing a seton needle armed with tape, silk, sheet lead, india rubber tape, or some other material, through the skin, tying it loosely, and allowing it to remain. The skin is to be pinched up or elevated above the sub-cutaneous cellular tissue, before the needle is passed.

The thread or silk is to be moved backward and forward daily, in order to keep up constant irritation. In this way an artificial ulcer is established, which continues to discharge, and thus a constant suppurative and derivative action is maintained.

This mode of revulsion is adopted in chronic thoracic diseases, diseases of the liver and other abdominal organs, cerebral and spinal affections, deep-seated inflammation, and after the healing of old ulcers, or to aid the healing process by establishing an artificial drain as a substitute for the one existing. The suppurative process may be facilitated by introducing a piece of the root of Phytolacca, Sanguinaria, Podophyllum, or some other irritant agent, into the ulcer, or by applying the blistering cerate or some irritant powder or ointment to the cord as it is drawn back and forth through the ulcer.

POTENTIAL CAUTERANTS, OR ESCHAROTICS.

Potential Cauterants, or Escharotics, are those caustic agents which applied to the human body destroy its texture. Their action is purely chemical. By their affinity for albumen and fibrin they unite with the animal matter, either forming new combinations with it, or by subverting the cohesion existing between its various elements. Their action is local. Some, however, may be absorbed, as the arsenious acid, and act upon the general system. They are employed for medicinal purposes as derivatives or suppurant revellents, or for the destruction of tumors, fungoid growths, hardened or indurated structures, or indolent or malignant ulcerated surfaces or formations.

POTASSA.

THERAPEUTIC ACTION.—As an escharotic, Potassa fusa is one of the most energetic, causing a speedy loss of vitality in the part to which it is applied. It is not free from objections, for the reason its ready deliquescence renders it somewhat difficult to localize its action.

It is sometimes employed in the formation of issues. For this purpose adhesive plastet should be attached to the part with an aperture the size of the intended issue. Envelop that end of the caustic to be held in the fingers with paper, moisten the other, and rub on the part until discoloration or destruction of the surface is effected.

POTASSA SESQUICARBONAS.

This preparation of Potassa is a mild but exceedingly valuable escharotic. It is much too mild for the formation of issues, destruction of tumors, cancroid growths, etc., and for opening abscesses; but as a topical stimulant and feeble though certain escharotic in cases of old, indolent ulcers, fistulous openings or pipes, chancre, opacity of the cornea, chronic inflammation of the conjunctiva, chronic eruptions, as tetter, ringworm, etc., it surpasses most, if not all the other escharotics with which we are acquainted. The powder is applied to the ulcerated surface mostly; if too active, a solution may be employed, the strength being graduated to suit the case.

LIQUOR POTASSÆ.

Liquor Potassæ, elsewhere described, is used in a concentrated state as an escharotic in cases of bites of rabid animals or poisonous reptiles. For purposes of this kind, if speedily applied, it is an efficient agent. It is likewise used in a diluted state as a stimulant and rubefacient lotion in rachitis, spinal irritation, arthritic swellings, etc. At present, the solution of potassa is but little used, either for internal or external purposes, other preparations of this alkali having taken its place.

POTASSA CUM CALCE.

Potassa Cum Calce is formed by rubbing together equal parts of hydrate of potassa and lime in a warm mortar, and kept in well-stoppered bottles.

This is not as powerful as the potassa fusa, but is more easily managed; it is used in the same cases and for the same purposes. When employed, it is made into a paste with rectified spirit, and applied to the part to be cauterized.

Potassa cum calce is formed into sticks, like the potassa fusa and nitrate of silver, by melting two parts of potassa and one of lime, and running it into iron molds. It is much used for the purpose of cauterizing the cervix uteri, in hypertrophy, ulceration, etc., as it is not so deliquescent, and its action does not extend beyond the part to which it is applied.

ARGENTI NITRAS.

Therapeutic Action.—Nitrate of silver is described as tonic, antispasmodic, astringent and escharotic. It acts as a corrosive agent when applied locally, producing a white mark from the union with and coagulation of the albumen of the cuticle, which finally becomes black. If the surface is moistened, and the nitrate applied three or four times, vesication slowly follows. Its local effects are much less painful than those of caustic potassa. Applied to mucous surfaces, it exerts the same influence by forming a white compound with the mucous secreted by the membrane. When swallowed, it unites with the mucus, chlorides and free hydrochloric acid, forming *albuminate* and *chloride* of silver, which are less poisonous than the nitrate. When exhibited in the form of solution, its action is much more energetic than when given in the form of pill. Many times, when first used in small doses, and the quantity gradually increased, no visible effect follows, although constitutional changes are being exerted. If taken in too large doses, gastrodynia, nausea, vomiting, and sometimes purging are liable to follow. In excessive doses it acts as a corrosive poison, causing severe pain, gangrene and sphacelus.

In small doses, and long continued, it is absorbed, as is manifested in the discoloration of the skin. It is generally thought to exercise a specific influence over the nervous system, and hence its reputed efficacy in epilepsy, chorea and other allied disorders.

The blueness or bronze hue of the surface occasioned by the protracted exhibition of this drug is, in most cases, permanent, and post-mortem examinations exhibit a similar discoloration of internal organs.

As a topical agent, its uses are varied and important. It is used as a stimulant, vesicant and escharotic, either in solution or in a solid state.

As a caustic, it does not deliquesce like the potassa fusa, and therefore possesses advantages over it.

It is employed to destroy fungoid granulations in wounds, ulcers, etc., and to chancres to neutralize or destroy the virus and change the ulcer, by destroying its specific character, and thus prevent absorption and the consequent secondary constitutional influences which are quite certain to follow without these precautionary measures are taken.

ZINCUM.

Zinc, in its metallic state, is inert. Its compounds act according to the degree of concentration. Internally, in large doses, they excite vomiting, and in smaller doses act as tonics and antispasmodics, and are used in intermittents and chronic diseases of the nervous system. In large doses they act as irritant poisons. Topically, they act as escharotics, astringents and desiccants. The chloride and sulphate are used as caustics; the sulphate and acetate as astringents; while the oxide and carbonate are used as desiccants. The properties of each will be fully discussed under their respective heads.

ZINCI SULPHAS.

THERAPEUTIC ACTION.—Sulphate of Zinc is described as tonic, astringent, antispasmodic, emetic, expectorant, escharotic, antiseptic and discutient. We seldom employ it, however, except as a local application.

In small and repeated doses it exerts an astringent action over the bowels, checks the secretion and produces constipation. It is supposed to exert a specific influence over the nervous system, remove spasmodic affections, cure intermittents, etc. It checks the secretions from both the pulmonary mucous membrane and that of the genito-urinary organs, as well as the bowels, by its astringent action; and hence its utility in catarrhal disorders of those parts. In full doses it acts as a powerful emetic, its action being speedy and unattended with the degree of nausea arising from most emetic agents. In very large doses "it acts as an irritant poison, producing vomiting, purging, coldness of the extremities, and fluttering pulse." Topically, it acts as a caustic, astringent and desiccant.

As an emetic, sulphate of zinc is a prompt and successful agent, and is used mostly for this purpose to expel narcotic poisons. In cases of poisoning by these agents many esteem it superior to any other agent in use.

As a topical astringent, its aqueous solution is much used as an application to bleeding surfaces; as a collyrium in chronic ophthalmia; as an injection in leucorrhœa, chronic gonorrhœa and gleet; as a gargle in ulcerated sore-throat; as a wash to ulcers attended with a profuse discharge or loose and flabby granulations; as a lotion for chronic skin diseases; and as a remedy for nasal polypi. As an escharotic, the Sulphate of

Zinc is one of the most important, being but little, and in many cases not in the least, inferior to the potassa fusa or sesquicarbonate of the same alkali. It is applied to old ulcers, chancres, exuberant granulations or fungoid growths, sarcomatous and scirrhous tumors, cancers, etc., as an escharotic or cauterant.

ZINCI CHLORIDUM.

THERAPEUTIC ACTION.—Chloride of Zinc is described as escharotic, alterative, and antispasmodic. We, however, only use it as an escharotic.

Its local action is that of a caustic, owing to its affinity for albumen and gelatin When applied to the surface, a sensation of warmth is experienced, soon followed by violent burning pain, which continues for many hours, or until vitality is extinguished, leaving a white eschar. It is a most energetic caustic, penetrating to deep-seated parts. No injury is caused by its absorption, as is the case with the arsenical and mercurial escharotics.

It has been applied to scirrhous and cancerous growths, fistulous and scrofulous ulcers, to destroy fungous growths and the *nævi materni*, or mother's mark. Fungous hematodes, syphilitic, cancerous, or scrofulous ulcers, and malignant growths, etc., are benefited it is supposed, not merely by its escharotic effect, but by the new action which the chloride induces in the surrounding parts.

In the treatment of cancer, chloride of zinc is combined with an equal part of gum arabic, and moistened to the consistence of a plaster. It is then thoroughly applied, crowding it into every fissure, and re-applied until the growth is thoroughly removed.

ACETIC ACID.

Concentrated Acetic Acid acts as a corrosive poison by dissolving the albumen, fibrin and gelatin, and thus disorganizing the animal tissues. Applied to the skin it acts as a rubefacient and vesicant. It is employed in porrigo, impetigo, ring-worm, eczema, and other chronic eruptive diseases. It is applied by means of lint or sponge wrapped around a stick. It causes acute pain, and finally produces whiteness of the abraded spots.

One or two applications is said often to be sufficient to effect a cure. Strong acid is also employed to destroy corns and warts. It is proposed as a rubefacient and vesicant in croup, and has been applied by means of blotting-paper or cambric moistened with the acid.

ACIDUM SULPHURICUM.

Sulphuric acid, whose properties have been fully discussed in another portion of this work, deserves a passing notice as an escharotic. It possesses powerful irritant and caustic properties, and is used as such in cases of wounds inflicted by rabid animals or poisonous serpents, for the reason it penetrates every part of the wound. It is applied as a caustic to the eyelid in cases of *entropium*, or inversion of the lid; likewise to the tunic in *ectropium*, or everted states of the lid; also to destroy warts, corns, etc. Velpeau speaks highly of a caustic paste made by mixing two parts of the concentrated acid with one part of saffron. This paste was used by him chiefly as an application to cancerous and other malignant growths, and ulcerations. It is sometimes employed in the form of an ointment as a rubefacient in cases of paralysis.

ACIDUM NITRICUM.

The properties of Nitric Acid are strongly caustic, and as such it is employed to destroy warts, corns, etc. It is likewise applied to the parts bitten by rabid animals, poisoned wounds, phagedenic ulcers, to chancres and chancroids, and recently to certain forms of hemorrhoids, etc. For nearly all uses it is preferable to nitrate of silver. The acid is to be applied by means of a pine stick. As a lotion to old indolent ulcers, about ten or fifteen drops should be added to the ounce of water.

ACTUAL CAUTERANTS.

By the term Actual Cauterant is understood the *incandescent iron and moxa*. The polished incandescent iron, when used for purposes of revulsion, acts promptly and powerfully, causing an instantaneous disorganization or destruction of the vitality of the part to which it is applied. Resort is had to it rarely of late, and when it is used at all it is in cases of emergency. It is mostly employed to destroy malignant growths, such as cancers, fungous hematodes, exuberant granulations, vitiated and malignant ulcerations, etc.

As a revellant, it was formerly, and is now occasionally, employed in deep-seated chronic affections of an inflammatory character, violent spasm of internal organs, sciatica, neuralgia, etc., when a speedy and powerful derivative action is desirable. Although the shock which it makes upon the nervous system is great, and the pain which it causes intense, yet its application occasions less than the potential cauterants, owing to the speedy action of the former, causing as it does an instantaneous destruction of the vitality of the part, and consequently the loss of sensation; while the latter acts slowly, requiring considerable time to effect a disorganization and entire loss of sensibility. The hotter the iron the more speedy the destruction and the less painful.' It should be applied quickly if at all, but we are fully persuaded that under no circumstances whatever need we resort to a practice so painful and one usually regarded so barbarous. When it is determined to have recourse to it, the surrounding parts should be carefully protected by means of wet paper or linen, with an aperture made in it of a proper size.

MOXA.

The Moxa consists in burning a small cone of some inflammable substance upon the skin, thereby producing cauterization, which may be continued only long enough to produce rubefaction or vesication, or sufficiently long to destroy the tissues and form a permanent eschar. In China and Japan the dried leaves of Artemesia Moxa are beaten and formed into a cone; in this country they are usually formed of cotton saturated with nitrate of potassa, or the pith of the common sunflower. Whatever substance is used, is formed into a cone, and surrounded with several thicknesses of linen. When applied to the part, it is set on fire at the top, and the heat and pain increase as combustion extends downward.

The Moxa is employed as a counter-irritant or derivative, and is considered appropriate in chronic diseases attended with lesions of sensation and motion. It is also resorted to as a means of counter-irritation in cases of deep-seated chronic inflammation, as of the spine, and in neuralgic affections.

DIVISION VI.

CLASS XIII.

ASTRINGENTS.

Astringents are remedies which, when brought into contact with any portion of the body, cause a contraction or condensation of the tissues. They have been supposed by most writers to exert their influence exclusively upon muscular fiber; and hence, to account for their action in all cases, they have asserted that this tissue exists in parts in which anatomists have never been able to detect it. All living tissues have a certain degree of cohesion and condensation, by which they are enabled to perform their various functions in the body. The loss of this, in diseased states, unfits them for the proper performance of their functions. This cohesion is caused by the stimulus of the blood when in a normal condition, and the influence of the nervous system.

Action of Astringents.—Astringents have a double action on animal tissues; they have both a chemical and dynamical action. All the vegetable astringents have the chemical property of coagulating albumen, as also have the mineral agents. This action, however, will not explain their effect upon the living body, for they could not combine with it to any great extent, without causing an entire loss of vitality As long as the vital force is in action, it opposes these chemical reactions, and when chemical laws gain the ascendency in a part, they destroy life in it. The dynamical action of those agents it is impossible to explain; we know that they will cause a condensation of any tissue with which they are brought in contact, and we have to be satisfied with a knowledge of the fact, and admit that the cause is beyond our reach.

Astringents are used both as topical and as internal remedies. Their topical effect we have already noticed—they cause constriction of any and all tissues with which they are placed in contact. The majority of these remedies are soluble in the fluids of the body, and when administered, are absorbed, and conveyed by the blood to the parts upon which they tend to act—their action in this case being similar to that produced when locally applied.

Therapeutic Application.—The therapeutic application of this class of agents is confined principally to excessive morbid discharges, and to weakened and relaxed conditions of particular parts. They are often prescribed in hemorrhages of different kinds, as hemoptysis, hematemesis, hematuria, menorrhagia, etc.; but they are more particularly recommended in hemorrhages of a passive character. When there is an atonic state of the vessels, the blood escapes by transudation through their relaxed walls; these agents increase the cohesion and condensation of the walls of the vessels, and thereby arrest it. In active hemorrhages, when connected with either a phlogistic or plethoric habit, their use is less apt to prove salutary, for they tend to increase the inflammatory condition. If an important organ is under an intense inflammation, it is evident that astringent medication must prove highly objectionable. Under such circumstances, if an active hemorrhage has occurred, the more active of this class of agents should not be used unless combined with sedatives. But it is always advisable to moderate the inflammatory condition of the system by the use of hydragogue cathartics, anodynes, diaphoretics, sedatives, and revulsives, before resorting to their use. In passive hemorrhages, no such preparatory measures are required; astringents may be administered at any time, and their employment will prove highly satisfactory.

In excessive mucous discharges they are very frequently and extensively employed with great advantage. Among the various diseases of this character which may be named, are diarrhea, dysentery, leucorrhea, etc. In these diseases, if there is active inflammation, with much febrile excitement, their use will be highly improper. This is especially the case in dysentery; in this disease the vitiated accumulations in the upper parts of the intestinal canal should be removed, and the morbid sensibility of the bowels subdued, as well as the high grade of inflammation and febrile excitement, before they are administered. If this is not done, they increase instead of relieving the disease. They are used with much advantage in diarrhea resulting from debility or chronic irritation; when it arises from acute inflammation, however, they are contraïndicated.

Leucorrhea is another disease in which there is generally a relaxed or atonic condition of a local or specific character, and not unfrequently connected with an enfeebled condition of the whole system. In the three diseases of the mucous membrane last named, this class of remedial agents, if properly selected, and properly timed as regards the intensity of the local or general excitement, will often prove singularly efficacious. They seem to condense the atonic fiber, diminish the size of the morbidly enlarged capillaries of the diseased parts, impart tone and vigor to the weakened and relaxed tissues, and in this way arrest the debilitating discharge. They act as topical tonics, and in local debilitated conditions like the preceding, they are of no small importance as auxiliaries to the use of tonics.

Astringents have also been used with much advantage in *diabetic* affections, in conjunction with emetics, hydragogue cathartics, stimulating diuretics, tonics and counter-irritants. By the use of the latter agents we arrest morbid associations, and direct the vascular and nervous afflux from the kidneys, and fix it alternately upon different points, or divide the excitement between different organs, and thus relieve the kidneys of the undue burden imposed upon them; while the astringent, being carried by the blood to the kidneys, and being excreted through them, constringes the weakened vessels, causes a condensation of the tissues, and thus diminishes the excessive product of the abnormal renal action.

In irritation or chronic inflammation of the bronchial mucous membrane, and even in phthisis, attended with copious and debilitating expectoration, connected with general debility and colliquative sweats, astringents of a mild and sedative character, or even the more active agents of this class, when combined with sedatives, frequently prove of much advantage. They diminish the excessive debilitating discharges, and thus sustain the vital energies of the system. In night-sweats not dependent upon any pulmonic affection but arising from some other local and chronic disease, or from general debility induced by a protracted course of some acute disease, astringents constringe the atonic cutaneous exhalants, and arrest the profuse discharge.

Astringents are very frequently employed as topical agents. They are used in *gonorrhea* after the acute inflammatory symptoms have been subdued by other measures; if they are resorted to in the early stages, before a suitable preparatory course of medication to lessen the inflammation, they often aggravate the disease, and often produce chordee, strictures, orchitis, etc. If the milder and less irritating astringents are used, in conjunction with anodynes and demulcents as injections, they will in many cases afford great relief, and exert a decidedly sanative influence over the disease.

Ophthalmia is another local affection in which they are used with occasional benefit. In the chronic form of this disease, after the pain has abated, and when the capillary vessels are left in an atonic condition, mild astringent collyria may be resorted to with a fair prospect of restoring the relaxed vessels to a healthy state, and arresting the profuse secretion. They will, however, prove highly injurious, if employed during the early stages of the inflammation; in this stage mucilaginous and sedative collyria, with emollient poultices, together with hydragogue and refrigerant cathartics, revulsives, etc., are most important.

In *apthæ*, in the anginose affections, as angina maligna, scarlatina maligna, or in any variety of angina, after the acute stage of inflammation has been moderated, they have proved useful. In all cases where there is extensive ulceration with a tendency to putrescence, the vegetable astringents are of unquestionable importance. They act as topical tonics and antiseptics, and should be freely used, either in conjunction with stimulants, or without them, as the case may seem to demand. They may be used in relaxation of the palate and elongation of the uvula with advantage. They are employed either in powder or as a gargle.

Astringents are also used as topical applications in prolapsus uteri, and prolapsus ani. In these cases they seem to condense the relaxed tissues, and arrest the abnormal mucous secretion resulting from the relaxation. Prolapsus uteri, in a large majority of cases, is dependent upon a loss of tone and relaxation of the vagina, and by using these agents in combination with tonics as vaginal injections, we give tone and strength to this canal, and remove the disease. The injections should be used three or four times a day, and employed cold if the condition of the patient is such that they can be used in this way.

They also claim our attention as curative agents in hernia. This disease always arises from a weakened state of some particular portion of the abdominal parietes. The important indication to be fulfilled is to harden and condense the weakened tissue, in order to enable it to oppose the necessary barrier to the advancing abdominal contents This opposing force is sometimes acquired by the frequen application of strong vegetable decoctions to the part, or by the use of plasters made of some of the most energetic astringent extracts.

They are important in the treatment of old, irritable, flabby and ill-conditioned ulcers. They are frequently applied in the form of a lotion to the ulcer, and at the same time as a poultice. They may be pulverized and mixed with the ulmus or althæ, and made into a poultice by simmering in milk, or even in water; or a strong decoction may be thickened with the ulmus, or with wheat or rye flour. They give tone and renewed vigor to the weakened vessels concerned in the ulcerative process, and increase the strength of the granulations.

Their general external application in the form of baths yet remains to be noticed. The extensive use which we hav made of them in this form, and the happy results which have attended this mode of employment, have given us a very high opinion of them as external medicaments. In adynamic fevers, and, indeed, in the advanced stages of all fevers, when there is extreme debility, they may be freely applied to the surface, by bathing, with great advantage. When there is great prostration of the vital powers, attended with profuse and exhausting colliquative sweats, and when the most potent stimulants and tonics fail to maintain the sinking powers of the system, we may then resort to astringent decoctions—either alone or in combination with stimulants—and apply freely and frequently to any part of the surface with brisk friction, with great advantage. They constringe and give tone to the cutaneous capillaries, and sudoriferous glands and ducts, and thus arrest the exhausting sweat; and their influence, conjoined with the brisk friction applied to the surface, frequently arouses the sinking energies of the system, and effects a reaction, which, if maintained by other medicine, may often result in a cure; and often an important cure may be ascribed to astringents thus used.

In many chronic diseases they are also of great importance when used in the same way. In *marasmus*, *tabes mesenterica*, *phthisis pulmonalis*, *scrofula*, in *dyspepsia* when of an obstinate character, in *chronic rheumatism*, and in many other chronic diseases, especially if attended with great debility and emaciation, a strong decoction of white oak or hemlock bark, applied once or twice daily, or two or three times a week, with brisk friction, will prove a powerful auxiliary measure in the cure of these very obstinate diseases.

Spirits may be added to the astringent bath, or the alkaline bath may occasionally precede it. These modifications and changes will frequently give increased value to the application. It seems to be a very powerful and valuable mode of medication. It lessens excessive nervous sensibility and irritability, by imparting tone to the entire system, and aids in breaking up morbid associations and cachetic habits. Those who have not tested the utility of this mode of employing astringents in the cases alluded to, and others analogous to them, may be disposed to undervalue them, but a fair trial will convince any one of their importance.

If astringents are long continued, either as internal or external agents, their general tendency is to lessen the sensibilities of the parts with which they come in contact, and augment their density.

QUERCUS.

THE BARK OF QUERCUS ALBA, RUBRA, ET TINCTORIA.—U. S.

THERAPEUTIC ACTION.—Oak Bark is astringent, tonic and antiseptic. The barks of the different species are similar in their medical properties, and the bark of one species is often used indiscriminately for that of others; those named above, however, are most frequently employed.

It is mostly used as an internal agent in passive hemorrhages, chronic diarrhœa in which there is great relaxation of the intestinal exhalants, an atonic state of the alimentary canal, and in chronic dysentery and ulceration of the mucous membrane of the bowels.

As a topical application we regard the Oak Bark as one of superior value in many instances. A decoction is advantageously employed as a gargle in ulceration of the fauces, and in cases of elongation of the uvula. It is also used in leucorrhœa, menorrhagia arising from an atonic state of the uterine vessels, and in prolapsus uteri depending upon an enfeebled state of the uterine appendages, also in prolapsus ani and bleeding hemorrhoids, as an injection and as a lotion to the affected parts.

Advantage may be obtained from its external application in the form of a bath. The bath is particularly indicated in diseases of children, when a combined tonic and astringent influence is desirable, and when the stomach will not tolerate the internal use of the proper medicines.

GALLA.

EXCRESCENCES FOUND ON THE TWIGS OF QUERCUS INFECTORIA.—ASIA.

THERAPEUTIC ACTION.—Nutgalls, owing to the large portion of tannic acid which they contain, are astringent in a high degree, Galls are mostly employed for internal purposes, in cases of passive alvine hemorrhages, in chronic mucous discharges from the alimentary canal, arising from atony of the intestinal exhalants, and also as chemical antidotes.

As a topical application, Nutgalls are beneficial in many cases, requiring the employment of powerful vegetable astringents. They are used as a gargle in aphthæ, ulceration of the fauces, mercurial salivation, relaxation of the uvula, and in a scorbutic or spongy condition of the gums.

STATICE.

THE ROOT OF STATICE CAROLINIANA.

Preparation.—Tincture of Statice.

Dose.—From ten drops to one drachm.

Therapeutic Action.—Marsh Rosemary is astringent, antiseptic, and tonic. It is a very powerful astringent, and is resorted to for that purpose in some parts of the country, particularly in the New England States. It is employed in aphthæ and ulcerated states of the mouth and fauces.

It may be used in passive hemorrhages from the bowels, uterus, etc. It may be used in night sweats arising from debility, and also in diabetic affections.

As a topical application it is by no means unimportant. As a poultice and also as a wash in flabby, ill-conditioned, fetid, or gangrenous ulcers, it is deservedly a popular remedy. It is also used as a poultice to cancers. In addition to its astringency, the saline properties which it possesses undoubtedly add much to its antiseptic virtues. It may be used as an injection in leucorrhœa, gonorrhœa, and blenorrhœa, also in prolapsus uteri, prolapsus ani, and as a wash in bleeding piles.

ACIDUM TANNICUM.

Dose.—From three to twenty grains.

Therapeutic Action.—Tannic Acid is one of the most powerful astringents of the materia medica; it coagulates albumen and causes condensation of all tissues with which it is brought in contact.

This agent is much employed to check profuse discharges from the bowels. In diarrhœa, when no inflammation of the bowels exists, it may be given with advantage; in fact, owing to the smallness of the dose, it is preferable to most other agents. In hemorrhage from the stomach and bowels, it is one of the most efficient agents that can be employed. But we consider it to be a waste of time to employ it as an astringent in hemorrhage from the lungs, uterus, kidneys, etc., as before it could prove of advantage it would have to be absorbed.

ACIDUM GALLICUM.

Dose.—From three to ten grains.

Therapeutic Action.—Gallic Acid is one of the most powerful of the vegetable astringents, although its local action is much milder than the tannic. It causes constipation of the bowels when used for any length of time, and may be employed as an astringent in diarrhœa, though for this purpose it is inferior to many other astringents. "It can be employed with the greatest advantage in all forms of passive hemorrhages; also to restrain various abnormal discharges It has been found very serviceable in menorrhagia, hemoptysis, hematemesis, hematuria, etc.; also in leucorrhœa, and in checking profuse sweating and profuse expectoration; it has also been used (and it has been stated with much advantage), in some cases of albuminuria, the discharge of albumen being greatly lessened by its administration."

GERANIUM.

THE ROOT OF GERANIUM MACULATUM.—U. S.

Preparations.—Tincture of Geranium. Geraniin.

Dose.—Of the tincture, gtt. x. to ʒss. Of Geraniin, gr. j. to grs. v.

Therapeutic Action.—The Crane's-bill is a very pleasant though powerful astringent. It is scarcely exceeded by any other indigenous vegetable astringent as an active and efficient agent, nor can any agent be found possessed of equal activity as an astringent, that is more, if indeed equally as acceptable to the stomach.

Geranium may be employed in all cases in which this class of medicines is applicable. In chronic dysentery, or in the sub-acute forms of that disease, after premising with suitable cathartics, much advantage is often derived from its exhibition. It is also used in diarrhœa and cholera infantum.

HEUCHERA.

THE ROOT OF HEUCHERA AMERICANA.

Preparations. — Tincture of Heuchera. Infusion of Heuchera.

Dose.—Of the tincture, gtt. v. to ʒss.

THERAPEUTIC ACTION.—Alum-root is astringent, styptic and antiseptic. It is a very powerful astringent, and may be used in cases of excessive morbid discharges wherever the Geranium or Statice is indicated.

It may be used internally in cases of hemoptysis, menorrhagia, uterine hemorrhage, etc.; also in cases of diarrhœa and chronic dysentery, and whenever there is a relaxed or atonic state of the intestinal mucous exhalants. It may be used in diabetes, leucorrhœa, copious bronchial secretions, night sweats, etc., as an internal agent.

CATECHU.

EXTRACT OF THE WOOD OF ACACIA CATECHU.—INDIA.

PREPARATION.—Tincture of Catechu.

DOSE.—From ten drops to one drachm.

THERAPEUTIC ACTION.—Catechu is astringent and tonic It is often used as an alvine astringent in cases of chronic diarrhœa and dysentery, unattended with inflammation. In those cases attended with a relaxed state of the intestinal exhalants, Catechu is an appropriate agent. In these cases it is often associated with prepared chalk, magnesia, opiates, and aromatics, with decided advantage. Its powerful astringent qualities adapt it to the relief of atonic hemorrhages. It is especially useful in immoderate menstruation, for which purpose it may be united with aromatics and opium.

KINO.

CONCRETE EXUDATION OF PTEROCARPUS ERINACEUS.—SENEGAL.

PREPARATION.—Tincture of Kino.

DOSE.—From one-half to one drachm.

THERAPEUTIC ACTION.—Kino is astringent and tonic. It is mostly employed to lessen or arrest excessive morbid discharges, whether of a sanguineous, serous, mucous or purulent character. In cases of diarrhœa and dysentery, unattended with febrile or inflammatory excitement, it often proves highly beneficial. It is more frequently exhibited in chronic diarrhœa. In excessive morbid discharges from the bowels, the Kino is often associated with opium and prepared chalk, or some other absorbents, as the carbonate or calcined magnesia.

HÆMATOXYLON.

THE WOOD OF HÆMATOXYLON CAMPECHIANUM.

PREPARATION.—Extract of Hæmatoxylon.

DOSE.—From one to five grains in solution.

THERAPEUTIC ACTION.—The Logwood is a mild, unirritating astringent, well adapted to all cases of chronic dysentery, diarrhœa, and profuse mucous discharges. As a mild astringent, perhaps we have none equally devoid of irritating properties.

We have found great advantage from the use of the extract of Hæmatoxylon in substance, and also the infusion in the bowel-complaints which occur in Cincinnati during the winter from the irritating effects of the muddy water, and also in the diarrhœas common to the hot season. For this purpose we combine it with aromatics and opiates.

BURSA PASTORIS.

PREPARATION.—Tincture of Bursa Pastoris.

DOSE.—From one to fifteen drops.

It may be employed in chronic menorrhagia where the menstrual discharge occurs too frequently or continues too long, or when the discharge is almost constant but colorless. There is a frequent desire to pass urine, and a deposit of phosphates. It has also proven a remedy in dyspepsia and chronic diarrhœa.

EPIPHEGUS.

THE ROOT OF EPIPHEGUS VIRGINIANA.—U. S.

PREPARATION.—Tincture of Epiphegus.

DOSE.—From five drops to half a drachm.

THERAPEUTIC ACTION.—The Epiphegus is astringent, antiseptic, and said to be antisyphilitic.

It is an energetic astringent, and as such it has been used in dysentery after the febrile and inflammatory excitement has been moderated. It is better adapted to the relief of chronic dysentery, chronic diarrhœa, and the relaxed and atonic states of the intestinal canal attended with profuse mucous discharges. It may be used in diabetic affections, profuse night-sweats, and in cases of profuse and debilitating expectoration, if not contra-indicated by febrile excitement.

TRILLIUM.

THE ROOT OF TRILLIUM PENDULUM.—U. S.

PREPARATION.—Tincture of Trillium.

DOSE.—From five drops to half a drachm.

THERAPEUTIC ACTION.—Trillium is astringent, tonic, pectoral, alterative and antiseptic.

The Trillium is exhibited in hemorrhagic affections. In hemoptysis we have found it a valuable agent. In the incipient forms of phthisis, attended with spitting of blood, cough, pain in the breast, etc., we can recommend the Trillium with much confidence to those who may prescribe it. We have often derived great advantage from the exhibition of the Trillium, Ictodes, and Arum tryphyllum, of each equal parts, in the form of a fine powder, mixed with honey, at the same time directing the free use of an infusion of the Lycopus, in the early stages of phthisis, attended with bloody expectoration, and even in the more advanced forms of the disease, attended with copious purulent expectoration, hectic fever, troublesome cough, etc. We have also found it important in passive uterine hemorrhages. In cases of menorhagia, attended with general debility, we regard the Trillium an agent of superior utility. It is likewise employed in hæmaturia with benefit. In this disease it may be used alone in the form of a powder, or associated with the peach leaves, in the form of an infusion. We have made free use of it in diabetes, and from the advantages derived from its exhibition in those diseases, we think it merits a conspicuous place among the list of our therapeutic agents, and one upon which much reliance can be placed in that formidable disease.

RHUS GLABRUM.

THE BARK OF THE ROOT.

THERAPEUTIC ACTION.—Sumach is astringent, tonic, diuretic, antiseptic, alterative and refrigerant. All parts of the plant have been used in medicine.

The bark of the root is used in diarrhœa and dysentery, or "bloody flux," made into a syrup, or used in a decoction prepared by boiling in milk.

The leaves and berries are said to be decidedly diuretic, and are exhibited in strangury, deranged states of the renal organs, and whenever this class of agents is required.

The bark of the root is considered alterative and somewhat tonic. It is recommended as an alterative in syphilis, scrofula and cutaneous diseases. It may be used internally, and applied externally as a wash. It may be advantageously associated with the rumex, both as an internal and alterative agent, and also as an external application.

An ointment or salve made of the bark or leaves is useful in tinea capitis, herpes, impetigo, and other cutaneous diseases.

The bark constitutes a valuable antiseptic and detergent poultice in cases of old putrid, indolent, foul, fetid or gangrenous ulcers; the decoction being used at the same time as a wash.

The decoction is also useful in prolapsus uteri and prolapsus ani; it may be used as an injection in fluor albus.

RUBUS.

R. VILLOSUS, R. TRIVIALIS, R. STRIGOSUS, AND R. ODORATUS.

THERAPEUTIC ACTION. — These agents are described as astringent, tonic, diuretic, detergent and nervine. They possess many properties in common, but as they differ in others it is well to give the therapeutic action of each a separate description.

Rubus Villosus.—The bark of the root of the Blackberry is a very valuable astringent. It has long been a popular remedy in atonic bowel complaints; is highly extolled by many of the late writers for its efficacy in chronic dysentery, diarrhœa and cholera infantum, and is especially recommended in the latter complaint.

Rubus Trivialis.—The roots of the Dewberry are closely analagous to those of the blackberry, in their medical properties. They possess astringent qualities in a higher degree than the blackberry. They are employed indiscriminately in place of that agent.

Rubus Strigosus.—The leaves of the Red Raspberry are mildly astringent, somewhat tonic, with some aromatic properties. As an agreeable, pleasant and acceptable agent to the stomach, we have no astringent surpassing the Red Raspberry.

As a mild and agreeable astringent, it is found very useful in the ordinary summer complaints of children. It may be used in combination with cinnamon, in cholera infantum, diarrhœa, secondary stages of dysentery, and also in atonic and relaxed states of the intestinal exhalants.

KRAMERIA.

THE ROOT OF KRAMERIA TRIANDRIA.

PREPARATION.—Tincture of Krameria.

DOSE.—From five drops to half a drachm.

THERAPEUTIC ACTION.—Rhatany root is astringent and tonic. It is one of the most powerful vegetable astringents, and is a remedy in all those cases requiring the employment of this class of therapeutic agents.

It is an appropriate remedy in cases of profuse mucous discharges. It is advantageously employed in chronic diarrhœa and chronic dysentery with great relaxation of the intestinal exhalants; it is also used in fluor albus, humid catarrh, blenorrhœa, diabetes, and in all cases attended with relaxation and debility of the solids.

It is recommended in hemorrhagic affections as in hemoptysis, hematemesis, intestinal hemorrhage, and especially in passive hemorrhages from the uterine organs, as menorrhagia.

TORMENTILLA.

THE ROOT OF POTENTILLA TORMENTILLA.—EUROPE.

THERAPEUTIC ACTION.—The root of the Tormentilla is astringent and tonic, and may be employed in all cases requiring the use of this class of agents. It is a pure and not an unpleasant astringent. It is exhibited in relaxed and atonic states of the solids, and also in cases of excessive mucous discharges.

URTICA.

THE ROOT OF URTICA DIOICA.—U. S.

PREPARATION.—Tincture of Urtica.

DOSE.—From one drop to half a drachm.

THERAPEUTIC ACTION.—Urtica is astringent, styptic, tonic, and diuretic. The seeds, leaves, juice and roots of the common nettle are all used occasionally for their remedial virtues. We have employed the roots in numerous instances as an astringent with unequivocal advantage, and we know of no single agent upon which we would sooner rely in all the ordinary cases in which this class of agents is indicated. It is powerfully astringent, and well adapted to all cases of chronic diarrhœa and dysentery, and to the relief of the summer complaints of children.

Owing to its reputed diuretic properties, it has been recommended in nephritic and calculous affections. The leaves and seeds are the parts mostly used for the relief of diseases of the urinary organs. It is also used in pleurisy, incipient phthisis, and in scorbutic affections. It is said to have proved useful in jaundice, and for the removal of worms. We regard it as an unimportant agent in the latter diseases. We should place, however, but little dependence upon any portion except the root, in hemorrhagic and mucous discharges. The seeds and flowers have been employed in intermittents in the place of the Peruvian bark.

Seeds and flowers are administered in doses of ʒj. Pulverized root, ℈j. to ʒss. or ʒj. Decoction, ℥j. to Oiss. of water, and boil to Oj.; dose, ℥j. to ℥ij.; cinnamon may be added.

GEUM.

THE ROOT OF GEUM RIVALE.—U. S.

Dose.—Powdered root, ℈j. to ʒj. three or four times a day. Decoction, ℥j. to Oj. of water; boil and strain; dose, ℥j. to ℥ij.

Therapeutic Action.—Water Avens is an energetic astringent and tonic. In the New England States it is a popular remedy in diarrhœa and chronic dysentery. It is likewise employed in passive hemorrhages from the uterus, bladder, kidneys, bowels, and also from the lungs.

It is decidedly tonic as well as astringent, and hence the utility of it in enfeebled states of the alimentary canal. It has gained some popularity in cases of phthisis, attended with debility and copious expectoration.

MYRICA.

THE BARK OF MYRICA CERIFERA.—U. S.

PREPARATION.—Tincture of Myrica.

DOSE.—From five drops to half a drachm.

THERAPEUTIC ACTION.—Bayberry is described as astringent, stimulant, tonic, diaphoretic, emetic, sialagogue, errhine, antiseptic and discutient.

Bayberry is esteemed valuable in diarrhœa and dysentery. In those complaints attended with general languor and debility, or atony of the bowels, its utility is dependent upon its astringent, stimulant, tonic and diaphoretic action. The warm infusion acts with considerable effect upon the surface.

The same reasons seem to point to its use and utility in dysentery; it is recommended and used with the most gratifying results in scarlatina, both as a general and local agent. While the warm infusion or decoction is being taken freely as a diaphoretic and stimulant, the throat is to be thoroughly and frequently gargled with the same, loaf-sugar or honey being added. Many children have been saved, it is said, by this article alone, who were thought by their attending physicians to be beyond the reach of medicine.

The bark is thought by many to possess superior efficacy in scrofula, a decoction being drank freely, while a poultice prepared of the powdered bark is to be applied to the ulcers or tumors, should any be present. In cases of open ulcers it acts as a topical excitant and detergent; applied to the tumor it acts as a discutient and resolvent. Some, indeed, have thought that it acts as a discutient and resolvent. Some, indeed, have pronounced it a sovereign remedy.

The decoction is recommeneded in jaundice and biliary obstructions; also in engorgements of the spleen, diseases of the urinary apparatus, and for the cure of dropsy.

It is much used in febrile and inflammatory diseases, colds, rheumatism, and numerous other disorders, by the Thomsonian class of physicians.

When masticated, it acts efficiently as a sialagogue, and may be used in paralytic or rheumatic affections occurring about the mouth or parts adjacent thereto. It is also much valued as an errhine in certain diseases of the head, and in morbid states of the nasal mucous membrane.

MONESIA.

THE BARK OF CHRYSOPHYLLUM BURANHEIM.

Therapeutic Action.—Monesia is astringent, stimulant and alterative. It is used in cases of profluvium of a mucous and sanguineous character, depending upon an atonic state of the system. Thus it has been employed with advantage in chronic diarrhœa and dysentery, in chronic bronchitis, hemoptysis, menorrhagia, leucorrhœa, etc.

MATICO.

THE HERB OF ARTANTHE ELONGATA.

Preparation.—Tincture of Matico.

Dose.—Of the pulverized Matico, from ʒj. to ʒji. Of an infusion of ℥j. to Oj. of boiling water, ℥j. to ℥ij.

Therapeutic Action.—Matico is astringent, styptic and stimulant. It has been employed to check hemorrhage from the lungs, bowels, kidneys, etc.; but, as it contains neither tannic nor gallic acids, Pereira supposes that what influence it has in these cases depends upon the volatile oil. It has been used, however, with undoubted advantage in discharges from mucous surfaces, as leucorrhœa, gonorrhœa, etc., possessing similar properties to the cubebs.

NYMPHÆA.

THE ROOT OF NYMPHÆA ODORATA.—U. S.

Dose.—Of the powdered root from ʒss. to ʒj. Of a decoction of ℥ij. to Oj. of water, boiled for fifteen minutes, ℥ij. to ℥iv.

Therapeutic Action.—The Nymphæa is astringent, tonic, discutient and emollient. It has been found beneficial in most cases of excessive mucous discharge, as diarrhœa, dysentery, leucorrhœa, etc. It has also been used in hemorrhagic affections, but in these cases it can not be advantageously substituted for other and more efficient agents.

A strong infusion has been found useful as an injection in leucorrhœa, being taken internally at the same time. It forms a valuable discutient and emollient poultice in painful inflammatory affections, scrofulous enlargement of the glands, tumors, white swellings, etc. The decoction is used as a gargle in ulcerated sore mouth, and as an injection in gonorrhœa, gleet, dysentery, and as a wash to old and indolent ulcers.

ERIGERON.

THE PLANT OF ERIGERON.—U. S.

Preparations.—Oil of Erigeron. Tincture of Erigeron.

Dose.—Of the Oil, gtt. j. to gtt. v. Of the tincture, gtt. v. to ʒss.

Therapeutic Action.—Erigeron is astringent, tonic, diuretic, diaphoretic and stimulant. It is an important agent in controlling excessive mucous and sanguineous discharges, and has been employed with advantage in dysentery, diarrhœa, uterine hemorrhage, hemoptysis, hematemesis, hematuria, etc. It has also been used with benefit in diabetes, nephritis, cystitis, and to subdue the irritation arising from the presence of calculi in the bladder.

As an astringent and styptic in hemorrhages, we think the Erigeron is one of our most efficient agents. The most profuse and alarming uterine hemorrhage has been speedily arrested by the use of the volatile oil. The extract, tincture and infusion have also been used in these cases with decided advantage. In coughs and chronic bronchial affections when attended with copious mucous or purulent secretion, and in the incipient stages of phthisis attended with bloody expectoration, this agent will be found to answer an excellent purpose.

ERECHTHITES.

THE PLANT OF ERECHTHITES HIERACIFOLIA.—U. S.

Preparations.—Tincture of Erechthites. Oil of Erechthites.

Dose.—Of the tincture, gtt. v. to ʒss. Of the oil, gtt. j. to gtt. v.

Therapeutic Action.—Fireweed is said to possess astringent, tonic, alterative, emetic, and cathartic properties. The recent plant has proved emetic and cathartic in large doses, though it is never employed for these purposes. It has been successfully used in dysentery, relieving the pain and checking the discharge speedily. It has also been highly recommended in diarrhœa, cholera infantum, and Asiatic cholera.

OLEUM ERECHTHITES

Is said to possess similar properties to the oil of Erigeron. We have used it to a limited extent only, but would substitute it for the Erigeron in any case, if that agent could not be obtained.

DIOSPYROS.

THE BARK AND FRUIT OF DIOSPYROS VIRGINIANA.

Dose.—Of an infusion of ℥ij. to Oj. of boiling water, from one to two ounces.

Therapeutic Action.—The bark of the Persimmon is astringent, tonic, and antiseptic. Dr. Barton considered it one of the most powerful of our native astringents. It is employed with advantage in diarrhœa and dysentery, especially where there is much prostration, and a relaxed and atonic condition of the bowels. It has also been used in cholera infantum, or the summer complaint of children. In these cases it may be given in the form of syrup, tincture, or infusion. In dysentery it may be advantageously combined with Leptandra and Rhubarb. It has also been employed in passive hemorrhages, it is said, with good results.

As a local application, a strong infusion has been advantageously employed as a gargle in ulcerated sore throat, and as a wash in sore mouth. The bark is antiseptic, and may be employed in the form of a poultice to gangrenous parts. The infusion is also employed to cleanse and stimulate foul and indolent ulcers.

SOLIDAGO.

THE LEAVES AND FLOWERS OF SOLIDAGO RIGIDA.

Dose.—Of the powdered leaves, from ʒss. to ʒj. Of an infusion of ℥j to Oj. of boiling water, f℥ij. to f℥iv.

Therapeutic Action.—This species of Solidago is astringent, styptic, tonic, and diuretic; it is the article used by Dr. Bone, of New Jersey, to arrest hemorrhages. It is recommended in hemoptysis and uterine hemorrhage in particular, and is said to be an agent of superior utility. It is also employed in hemorrhage from the bowels and urinary organs and likewise in excessive mucous discharges, as in diarrhœa, dysentery, leucorrhœa, etc., and in profuse sweats arising from debility. It has been employed in chronic diseases of the urinary organs, as chronic nephritis, albuminuria, cystitis, etc., with reported advantage.

PINUS.

THE BARK AND CONCRETE JUICE OF PINUS CANADENSIS.

Preparation.—Tincture of Pinus Canadensis.

Dose.—From five drops to half a drachm.

Therapeutic Action.—The inner bark of the common Hemlock affords a mild and valuable astringent, useful in all cases requiring the employment of agents of this class.

The decoction is exhibited in chronic bowel complaints, and whenever there is a relaxed state of the intestinal exhalants; aromatics may be added to render it acceptable to the palate, and to improve its medical virtues. Hemlock may also be employed in cases of copious bronchial secretions, in leucorrhœa, diabetes, etc.; and likewise in passive sanguineous discharges, as from the uterus, bowels, kidneys, lungs, etc.

The decoction constitutes a useful gargle in cynanche and the various aphthous and ulcerated states of the mouth.

The impalpable powder has been inhaled with advantage it is said in cases of phthisis pulmonalis.

As a topical agent, the decoction may be used in fluor albus, prolapsus uteri and ani, and also as a wash to flabby and gangrenous ulcers; the powder is valuable as a poultice to old ulcers, and to parts that are gangrenous.

The oil of Hemlock is used for internal and external purposes. It is highly stimulant, diaphoretic and diuretic. It has been found useful in chronic rheumatism, lumbago, sciatica, and also as a diuretic in cases in which there is torpor of the renal organs. It may be used in colic, spasm of the stomach or bowels, pain in the breast, etc.

The oil or essence forms a useful rubefacient embrocation. It may be combined with other essential oils, and used as a liniment in cases of rheumatism, lumbago, sciatica, sprains, bruises, local inflammations, etc., as parotitis, trachitis, and mastodynia.

SPIREA.

THE PLANT OF SPIREA TOMENTOSA.—U. S.

DOSE.—Extract, grs. v. to ℈j. Decoction, made by boiling one ounce of the plant (root is best) in one pint of water; one to two ounces when cold.

THERAPEUTIC ACTION.—Hard-hack is astringent and tonic. It is an energetic astringent, yet less apt to disagree with the stomach than many other agents belonging to this class.

It is highly recommended in all the cases in which this class of agents is ordinarily prescribed, such as diarrhœa, dysentery, cholera infantum, menorrhagia, fluor albus, and indeed in most cases of profuse mucous discharges, and likewise in those of a passive sanguineous character.

ACHILLEA.

Yarrow or Milfoil is a mild astringent and feeble aromatic tonic, possessed of excitant properties.

We have used this article mostly for restraining morbid sanguineous discharges. We have found it decidedly beneficial in hemoptysis, hematemesis, and menorrhagia, or passive hemorrhages from the uterine organs. In these cases we have not unfrequently exhibited it alone, perhaps more frequently conjoined with the Lycopus Virginicus, and rarely without deriving much advantage from its use. It has been found beneficial in the bleeding piles. dysentery, diarrhœa, leucorrhœa, used both internally and locally, etc., and some speak of it favorably in intermittents, retention of the menses, flatulent colic, nervous debility, and likewise to remove various obstructions, counteract spasm, and purify the blood.

FRAGARIA.

The vine and leaves of the Strawberry are mildly astringent and diuretic. They are employed in bowel-complaints like cinquefoil and raspberry leaves. They have a tendency to check excessive mucous secretions and impart tone to the bowels.

They are also used in dysuria and painful irritation of the urinary organs. In chronic irritation or catarrhal affections of those organs, they are said to be decidedly valuable. In calculous affections and in strangury, the decoction may be used freely.

BISTORTA.

DOSE.—Powder, grs xx. to xxx. Decoction, ℥ij. to Ojss. of boiling water; dose, one to two ounces.

The Polygonum Bistorta, or Bistort root, is said to be a powerful astringent, depending on the tannic acid which it contains. It is also tonic, and owing to the presence of starch it is nutritive, and is roasted in Siberia and eaten.

Bistort is considered applicable to the same cases in which other astringents are employed, although it is but little used.

POTENTILLA CANADENSIS.

The root or vine of the common Five Finger or Cinquefoil, is a mild astringent, and very well adapted to the relief of many cases requiring the exhibition of these agents. In chronic diarrhœa, dysentery, and wherever there is a relaxed and enfeebled state of the alimentary canal, it is found to be a useful remedy. It checks the secretions, and gives tone and vigor to the bowels. It is also beneficial in sanguine discharges. In passive hemorrhages, particularly in menorrhagia occurring in relaxed habits, a strong decoction of the Potentilla is found very useful in restraining the immoderate discharge. In hematuria and hemoptysis, it is capable of doing much good. Diabetes and leucorrhœa are diseases in which advantage may be derived from its use.

AGRIMONIA.

Agrimonia is a mild astringent and tonic, and used in diarrhœa, dysentery, and passive hemorrhages. Its astringent, tonic, and demulcent properties recommend it to our notice in relaxed and atonic states of the bowels, attended with irritation or chronic inflammation of the mucous membrane, and in cases of either mucous or sanguineous discharges. The root is to be preferred as an astringent and corroborant, and the top as a demulcent and diuretic. We have frequently resorted to the agrimony in suppression of urine, in cystitis, nephritis, and in all cases of irritation or inflammation of the urinary organs.

COMPTONIA

Sweet Fern is mildly astringent and somewhat tonic. It is used in New England in diarrhœa, dysentery, cholera infantum, and in cases of general relaxation, and in debilitated states of the bowels. In these diseases it forms a grateful astringent, tonic, and aromatic drink, prepared by adding sugar and cream to the decoction. It is acceptable to the stomach and agreeable to the taste.

HAMAMELIS.

THE LEAVES OF HAMAMELIS VIRGINICA.—U. S.

PREPARATION.—A distilled tincture.

DOSE.—From the fraction of a drop to half a drachm.

THERAPEUTIC ACTION.—Astringent, tonic, sedative, discutient, styptic, antiseptic. The bark and leaves of the Witch-hazel are mild yet energetic stimulants. Though less frequently used than other agents, they are really useful in the various cases in which this class of medicines is indicated. The bark is the most active as an astringent. It is used with advantage in bowel complaints attended with great relaxation of the intestinal mucous exhalants in infusion or decoction. The infusion of the leaves is useful in various internal hemorrhages, as hematuria, menorrhagia, hematemesis and hemoptysis; and likewise in diabetes and fluor albus. Combined with Trillium latifolium and exhibited freely, it has proved very advantageous in the last named diseases. The same combination is also highly valuable in hemorrhagic discharges; and in all these affections the Lycopus Virginicus constitutes an important addition.

Hamamelis is beneficial in hemorrhoids, particularly in the bleeding piles, with atony of the perineum.

Its value in both mucous and sanguineous discharges depends partly on its tonic properties.

As a topical application, Hamamelis is valuable, applied to painful inflammatory tumors, sprains, and bruises. Its astringent, antiseptic and discutient properties render it a valuable application to old flabby, foul, fetid and gangrenous sores or ulcers. Wash and then apply as a wet dressing.

BISMUTH.

Preparations.—Subnitrate. Liquor Bismuth.

Dose.—Of the first, grs. j. to v.; of the second, ʒss. to ʒj.

Bismuth is indicated by an elongated and pointed tongue, red, uneasy sensations in the stomach with heat, eructations of acid or acrid material, irritative diarrhœa.

Subnitrate of bismuth may be employed with advantage in some cases of gastrodynia and water-brash, and occasionally as a remedy for nausea and vomiting. It is frequently employed as a remedy for diarrhœa, but is not nearly so good as the solution.

I frequently use the liquor bismuth in irritative diarrhœa, and in dysenteric diarrhœa, with excellent results. It may also be employed in the diarrhœa of typhoid fever, if the discharges are large and too frequent. It will be found an admirable remedy in those cases of chronic diarrhœa, with irritation of the stomach and acrid eructations.

CREASOTUM.

Creasote is frequently used as a local, and sometimes as an internal agent, with a view to its styptic and indirect astringent effects. When applied to a bleeding surface, it causes coagulation of the albumen of the blood, and thus an obstruction in the mouths of the bleeding vessels; it is also supposed to cause contraction of the vessels by its stimulating influence.

ALUMEN.

Therapeutic Action.—Alum is astringent, styptic, purgative, and escharotic. Its immediate effect in medicinal doses is that of an astringent. It causes a corrugation of fibers and a contraction of the capillary vessels, and thus lessens or even checks temporarily exhalation or secretion, and hence the dryness of the mouth and throat, the increased consistency of the stools, and less frequent purging.

If too freely applied to a part, the astriction is followed by irritation, and the paleness first induced by its corrugating effects, is succeeded by preternatural redness. Internally, "alum excites nausea, vomiting, griping, purging, and even an inflammatory condition of the intestinal canal."

FERRI SULPHAS.

Dose.—From one to five grains, in the form of pill; Velpeau used a solution of three to five ounces of water, to repress erysipelas; a solution may be used in ophthalmia of one to two grains to one fluid ounce; and as an injection in gleet, four to ten grains to one ounce of water.

Sulphate of Iron is a powerful local astringent, and as such is employed to check hemorrhage from small vessels, in cases of cuts, wounds, etc. It is also used to check profuse mucous discharges, as in chronic ophthalmia, leucorrhœa and gleet, and to ulcerated surfaces to stop the purulent secretion. As an internal remedy, it lessens the secretions of the alimentary canal, and hence has been used in chronic diarrhœa, dysentery, etc. It has also been employed to check excessive secretion as in chronic mucous catarrh, humid asthma, leucorrhœa, gleet, diabetes and colliquative sweats

FERRI PERNITRAS.

Dose.—From ten drops to half a drachm.

The Pernitrate of Iron, heretofore described, is a valuable astringent in dysentery, and the summer complaint of children. It has also been used with advantage to check profuse mucous discharges, as in leucorrhœa, chronic bronchitis, etc., and to control hemorrhage from the stomach, bowels and uterus, especially in persons of a feeble and languid habit. (See Tonics.)

TINCTURA FERRI CHLORDI.

The Tincture of the Muriate of Iron, which has already been described as a tonic, is a useful astringent and styptic as well as tonic, and is applicable to those cases requiring the astringent and tonic action of the ferruginous salts. It is particularly recommended in asthenic or passive hemorrhages. In hematemesis, hematuria, uterine hemorrhages, and also in excessive mucous discharges, it has been found beneficial. In cystorrhœa, gleet, and diabetes, and also in suppression of urine, dysuria, etc., it has been found advantageous. It is a useful tonic, and may be used in chlorosis, scrofula, anæmia, anorexia, general debility, etc., with considerable benefit.

DIVISION VII.

CLASS XIV.

EXPECTORANTS.

Expectorants are agents which promote the evacuation of mucus from the respiratory organs. This they may do by allaying inflammation of the mucous membrane, which in its first stages always diminishes or suppresses the normal secretion of mucus; or by stimulating this membrane when relaxed, causing an increased flow of blood to it, and increased action of the mucous follicles; by rendering it thinner and less viscid, enabling the patient to bring it up; or lastly, by exciting an action of the respiratory muscles, causing an evacuation of mucus already secreted, as in the act of coughing or vomiting.

This secretion is very materially influenced by a variety of pathological conditions of the general system, as well as of the pulmonary mucous membrane. Thus a high grade of fever will as certainly diminish the pulmonary secretion, as a local inflammation, while an asthenic condition of the system will increase it. It is modified by acute as well as chronic pulmonic inflammation; by spasmodic action of the air-passages; by irritation of the innumerable ramifications of the pneumogastric nerves; by a paralysis of the nerves distributed to these organs; or, lastly, by disease of contiguous viscera, the heart, stomach and liver. These various conditions influencing this secretion, clearly demonstrate the necessity of properly discriminating between the diversity of pathological states existing, before recourse is had to the more active agents of this class.

Action of Expectorants.—A question of much interest to the pathologist, as well as the therapeutist, is, how do these agents termed expectorants act? Do they act specifically upon the respiratory organs, or do they act indirectly upon them in promoting the secretion and discharge of mucus? If we except the various topical expectorants, or inhalations, we may regard them mostly as indirect agents. It can not, however, be denied that some of the balsams, the garlic, onions, asafœdita, etc., when administered are absorbed, and excreted from the blood through the lungs. This is proved by the odor which they impart to the breath, though this is but their volatile principle. This may, however, exert some specific influence upon the respiratory passages in its transmission through them, by stimulating the pulmonary exhalants; but the general rule that the sanative action of expectorants is indirect, remains uninfluenced by this admission.

As has been already stated, the diversity of the pathological conditions of the general as well as pulmonic systems, require very different agents at different times, to fulfill the indications. In many cases, difficult or deficient expectoration depends upon an acute inflammation of the pulmonary mucous membrane. In these cases it is evident that whatever tends to lessen the inflammatory action, must tend to produce more copious secretion and expectoration. Hence we find nauseant and emetic expectorants of much value in such cases. If we administer nauseants, they act as sedatives, diaphoretics, antispasmodics, and may produce emesis, if given in sufficient quantities. By their sedative influence they control the action of the heart, and thus diminish the quantity of blood sent to the respiratory organs; by their relaxant powers they tend directly to lower the inflammation and remove the constriction of the mucous membrane; and acting as diaphoretics they equalize the circulation, and exert a powerful revulsive influence. Though these agents are among our most efficient expectorants, yet it is evident that they act indirectly upon the respiratory organs. Cathartics, emetics, diaphoretics, etc., by their sedative, depletive and revulsive influence, equalize the circulation, and thus act as indirect expectorants, in this condition of these organs. Topical revulsives, though local and indirect in their action, may often, by exciting a new point of irritation, relieve the determination to the lungs and increase the mucous secretion. Again, sedatives, as the veratrum viride, gelseminum, aconite, etc., by their power over inflammatory action, often prove our most efficient expectorants in acute inflammation. In short, whatever tends to diminish the inflammatory condition, tends to promote expectoration if diminished from this cause; while expectorants of an exciting character are contraïndicated.

If, however, the inflammation has been subdued by proper medication and the secretion of the bronchial mucous is profuse, and the vital powers are not adequate to the task of throwing off the mucus, we derive much advantage from the use of agents of an exciting and sustaining character, such as the balsams, myrrh, asafœtida, gum ammoniacum, etc., either alone or united with some of the milder tonics, in facilitating expectoration by their stimulant effect upon the mucous membrane, and by imparting vigor to the respiratory muscles.

Cases of extreme debility of the general system sometimes occur in persons advanced in years, or as the result of protracted disease, in which the mucous membrane and follicles lose their tone and give rise to a profuse secretion. The catarrhal affections of old age, cases of humoral asthma, chronic bronchitis, etc., are examples of this kind. In such cases as these, if the general health is improved, and such agents employed as will condense and give tone to the relaxed mucous membrane, as tonics and astringents, the amount of fluid secreted will be greatly diminished, and the process of expectoration will be greatly facilitated by the increased vigor imparted to the muscles. In this way some of the stimulating expectorants, and even tonics, may restrain the secretion when profuse, and promote it when scanty.

Suppressed or diminished expectoration may also arise from a torpor of the mucous membrane and follicles of the air-passages. In this case some of the more stimulating balsamic agents, as the balsams of Tolu or Peru, myrrh, the terebinthina, etc., whose active properties seem to be readily absorbed, and pass off through the lungs, may be resorted tc with a prospect of advantage. If any agents, except medicated inhalations, exert a direct action upon the lungs, these may be included in that list; they stimulate the mucous membrane, cause an increased flow of blood to it, and thus cause an increased secretion and excretion.

In spasmodic disease of the respiratory organs, the mucous secretion is nearly always much diminished or entirely checked, as in asthma. Here a different class of agents are applicable; all those that act as antispasmodics, and relax the spasm of the air-passages, prove expectorant.

The physician is often called to prescribe for cases of harrassing and protracted cough, unattended with any considerable expectoration, arising from an irritation of the mucous membrane of the air-tubes, or from some fixed irritation of the pneumogastric nerves. In these cases the use of narcotics, as opium, morphia, hyoscyamus, etc., are found to be the most effectual agents, when given internally, in allaying the irritation and cough; while other narcotics used as inhalations, as the tobacco, stramonium, etc., are found, in many instances, to be very valuable, and even in many cases sufficient to speedily arrest it. Spasmodic asthma, spasmodic croup, and spasmodic coughs in general, are easily arrested in many cases by the use of inhalations.

There is another source of fixed irritation in the lungs which requires to be noticed; we allude to the presence of tubercles in the lungs. In this case the tubercle maintains a constant irritation, which gives rise to incessant cough; the mucus is discharged as soon as secreted, and before it accumulates in the lungs to even a limited extent; hence the appearance of deficient expectoration; whereas, if the irritation is allayed and the frequency of the cough abated, by the use of sedatives and narcotics, the mucus will accumulate, and when expectorated, will give the appearance of increased expectoration. In tuberculous disease, agents which increase the secretion of the mucous membrane should never be used; for no good can result from their employment, but much injury. The disease is a disease of the blood; it not being duly elaborated, owing to a deficiency of the vital powers of the system, and the deposit of tubercle is but the result of this defective vitalization. Even if the tubercles could be removed by the expectoration, the cause still existing they would still be deposited. Not only do we derive no benefit from these agents, but they directly increase the debility of the system, and thus increase the disease. If there is any cure for tuberculosis, it is to be accomplished by allaying the irritation of the lungs, and by increasing the quantity and quality of the blood,—directing our remedies to the cause, and not to the symptoms of the disease.

There are numerous cases of coughs arising from irritation of the fauces, larynx or pharynx. In such cases *demulcents* may be used freely and with advantage. They allay the local irritation which excites the cough, and by their continuous use for a short time the irritation is removed. They are also beneficial in other cases, where the cough arises from an irritation of the mucous membrane of the lungs and bronchia. Their soothing influence upon the fauces and mucous membrane generally, with which they come in contact, is extended both by contiguous and continuous sympathy to the mucous membrane of the air-passages, and thus they allay irritation and abate the cough.

Expectoration is often facilitated by the act of vomiting. Emetics relax the pulmonary and cutaneous constriction, promote the secretion of mucus, and facilitate its discharge by compressing the thoracic viscera during the act of vomiting. Their influence is often very beneficial in the treatment of various pulmonary affections.

Before closing our description of the therapeutic action of this class of agents, we deem it proper to advert to the salutary effects of *topical expectorants* or *inhalations*. By the use of inhalations of a soothing, relaxing and anodyne character, in cases of inflammation or irritation of the bronchial mucous membrane, great relief is often experienced. If acute inflammation of the respiratory passages exists, inhalations of the vapor of hot water, hot vinegar, hot medicated vapor, as from an infusion of bitter herbs, etc., seems to soothe and allay irritation, lessens the inflammation, relaxes the constricted or spasmodic state of the extreme bronchial ramifications, promotes secretion, and renders expectoration easy. Ether, and some of the volatile oils, are sometimes added to the infusion, which renders the inhalation still more important in some cases. In dyspnea, ether, in which the extract of cicuta has been dissolved, has been used with great efficacy. Camphor has been used with much advantage in spasmodic coughs, croups, asthma, etc.

In cases of extreme irritation of the respiratory passages, attended with spasmodic cough, as in some forms of asthma, or in cases of troublesome cough, arising from an irritation of the pneumogastric nerves, unattended with inflammation, the inhalation of the vapor of some narcotic and anodyne agent, or the inhalation of the fumes of the same article, will, in many cases, give prompt and entire relief. The stramonium, conium, hyoscyamus, digitalis, tobacco, etc., are used in these cases. In other cases there seems to be a loss of innervation of the lungs from partial paralysis of the nerves distributed to them, in which case agents of an exciting character are required. The fumes of boiling or burning tar, resins, feathers, horse hair, balsam tolu and Peru., benzoin, etc., stimulate the nerves, promote the secretion and excretion of mucus, and in this way often give relief. These inhalations are valuable in chronic bronchitis, and other similar diseases.

We have thus seen that the majority of the agents belonging to this class, exert their influence indirectly, and that they should always be selected with special reference to the condition of the respiratory organs and the general system. As Dr. Dunglison remarks, "Almost every division of medicinal agents may become expectorants, according to the precise condition of the system generally, or of the pulmonary organs particularly; and hence we find an expectorant effect equally from depletives, and from tonics and excitants, from narcotics and counter-irritants, and from nauseants and emetics."

The reader will notice that the word "expectorant" is used in a very broad sense. It does not mean that remedies must cause increased secretion of mucus, much less of muco-pus. We recognize the fact that in a normal condition mucus is secreted in just such quantity as will lubricate the muous membrane of the air-passages, and facilitate respiration. If these passages become dry, then remedies which increase secretion are curative. If the air-passages are filled with mucus, which is not removed by an ordinary cough, then remedies that facilitate its removal are important to free respiration and a relief of the cough. If there is a very large secretion of mucus, respiration is impaired, and a remedy which will check this secretion is of benefit, and is called an "expectorant."

In the treatment of acute disease of the respiratory apparatus, we now endeavor to relieve irritation, and stop determination of blood, without producing more than normal secretion. Many times this may be accomplished by the treatment of the symptomatic fever, lessening the frequency of the pulse, reducing the temperature, relieving irritation of the nervous system, establishing secretion, and rectifying wrongs of the blood. And in addition to this we have many remedies which exert a direct influence upon the respiratory apparatus, for the relief of irritation and disease.

LOBELIA.

PREPARATION.—Tincture of Lobelia Seed. Acetum Lobelia.

DOSE.—Of the tincture, from the fraction of a drop to ten drops. Of the Acetous tincture, ten drops to one drachm.

Lobelia has been already fully described under the class Emetics, hence, we have in this place only to describe it as an expectorant. For this purpose we consider it one of the most valuable agents of the materia medica, and there is, probably, no other one that is so frequently resorted to for this purpose.

Its expectorant action is indirect, as is the case with all our most valuable remedies of this class. We may probably consider its action in diseases of the respiratory apparatus, in three different ways, according to the doses administered.

As a Nauseating and Sedative Expectorant.—As a nauseating expectorant we have no better remedy than the Lobelia, given in doses just sufficient to keep the patient nauseated. It causes relaxation of the system, diminishes the force and frequency of the pulse, produces diaphoresis, and increases the secretion from the bronchial mucous membrane. To fulfill these indications, it is employed in pneumonia, bronchitis, pleurisy, laryngitis and croup; in all these diseases it is supposed to check the progress of inflammation, check exudation of coagulable lymph, and increase the secretion of mucus; it also prevents a determination of blood to the lungs in a marked manner.

As a Stimulating Expectorant.—In doses not sufficient to nauseate the patient, the Lobelia acts as a stimulant—its influence being especially exerted upon the respiratory organs. It is employed for this purpose wherever there is evidence of a want of tonicity of the mucous membrane, when the secretion is either deficient or profuse, as in chronic pneumonia, bronchitis and laryngitis, phthisis pulmonalis, etc. It is also considered an efficient agent to promote absorption in hepatization of the lungs.

In asthenic laryngitis, with loud mucous rales in all parts of the chest, and great oppression, we have no remedy in the materia medica equal to this. It may be given with water in the usual way, or combined with spirits of lavender.

SANGUINARIA.

Preparations.—Acetous Tincture of Sanguinaria. Sanguinarine.

Dose.—Of the first, gtt. j. to ʒss. ℞ Sanguinarine grs. iv., water or syrup ℥iv.; dose, one teaspoonful.

The action of Sanguinaria is something similar to that of Lobelia. It is principally used, however, as a stimulant expectorant, though sometimes as a nauseant, and very rarely as an emetic. In croup, asthma, and acute bronchitis, it has been highly recommended as an emetic, though from the severity of its action we would prefer other agents. It is a valuable stimulating expectorant, and may be used either in deficient or redundant expectoration, if either depends upon debility of the mucous membrane. Thus in chronic bronchitis, humoral asthma, etc., there is enlargement of the capillary vessels and relaxation of the mucous membrane; the excess of secretion depends upon this. Sanguinaria and other remedies of its class, by their excitant action, stimulate and give tone to the mucous tissue, and the expectoration is proportionately diminished in quantity. In other cases there is atony, with deficient circulation and consequent diminution of the secretion; frequently in cases of this kind the Sanguinaria restores the secretion. Sometimes the Sangunaria is given in cases where the secretion is diminished from acute inflammation; in this case larger doses are employed to nauseate the patient, depress vascular activity, promote diaphoresis, and thus by equalizing the circulation and producing relaxation, it induces expectoration. It is exhibited as an expectorant in typhoid and acute pneumonia, bronchitis, asthma, croup, pertussis, and in phthisis pulmonalis.

IPECACUANHA.

Dose.—Tincture of Ipecac gtt. x. to gtt. xx., water ℥iv.; a teaspoonful every hour.

Ipecacuanha exerts a specific influence upon mucous membranes, relieving irritation, and arresting the inflammatory process. It also stimulates a better circulation and innervation, increases nutrition, and thus favors functional activity.

We employ it with very marked advantage in the treatment of infantile pneumonia, associated with Aconite and Veratrum. In some cases, the prescription of Ipecac alone will be sufficient to arrest the disease in two or three days, especially if given in the first stages. It is also employed with excellent results in diseases of the respiratory apparatus of the adult.

SCILLA.

Dose.—In substance as an expectorant, gr. j., gradually increased to grs. iij., or grs. v. Syrup of Squills gtt. v. to ʒss.

Squill possesses expectorant and diuretic properties, and in large doses it occasions vomiting and purging. It is employed as a stimulant expectorant, where there is evidence of a want of tonicity of the mucous membrane of the air passages, as in bronchitis and pneumonia; when the acute symptoms have been subdued; in chronic bronchitis and laryngitis, and in croup, occurring in children of a debilitated or strumous habit.

It is sometimes advantageously combined with nauseants, even in acute inflammation, where there is much debility; but is more frequently combined with other stimulant expectorants, as the gum-resins, as an excitant to the mucous membrane. It is a well ascertained fact, but not generally known, that the Squill, in substance, is a much better expectorant than any of its preparations.

SENEGA.

THE ROOT OF POLYGALA SENEGA.—U. S.

Preparations.—Tincture of Senega. Syrup of Senega.

Dose.—Of the tincture, gtt. j. to gtt. x. Syrup ʒss. to ʒj.

Therapeutic Action.—Senega is described as expectorant, diuretic, diaphoretic, emmenagogue, stimulant, sialagogue, alterative, emetic, cathartic and resolvent. The therapeutic properties of this agent are by no means inconsiderable, and from the great diversity of active properties which it is admitted to possess, it must be obvious to every one, at a glance, that it is an important remedial agent, and one that is capable of exerting a strong influence over diseased states of the system. Its most prominent effect upon the system seems to be that of increasing or promoting expectoration.

Senega is an energetic, stimulating expectorant, too exciting to be used in the early and active stages of pneumonic inflammation, unless combined with nauseants or demulcents.

Its action is in proportion to the dose; in small doses it is diaphoretic, diuretic, expectorant, stimulant, etc., while in larger doses it acts as an emetic and purgative.

It has been used as a general alterative in various cases requiring the use of this class of agents, and from its almost universal and searching influences upon the organs and tissues generally, and from the increase which takes place in most of the secretions when it is taken, we can readily infer its alterative properties are by no means its least important ones.

Probably its action in squamous disease of the skin is the most certain, and for this the tincture may be prescribed in small doses.

ARUM.

THE ROOT OF ARUM TRIPHYLLUM.

Preparation.—Tincture of Arum.

Dose.—From the fraction of a drop to half a drachm.

Therapeutic Action.—Indian Turnip is expectorant, diaphoretic, stimulant, rubefacient and febrifuge. The recently dried root is a valuable remedy in coughs, colds, catarrhs and pectoral affections; more especially in the chronic and subacute forms of these diseases. Even in the acute forms of pulmonary inflammation, if properly combined with nauseating expectorants, or with demulcents, it may be exhibited with safety and advantage. It has been advantageously employed in pertussis and asthma, and also in chronic rheumatism. It seems to be more especially indicated in those cases in which expectoration is difficult, owing to an enfeebled or atonic state of the respiratory apparatus. Even the fresh root may be employed in these cases, by grating it and mixing it with four or five times its weight of sugar, so as to form a conserve, of which half a drachm may be given. It is sometimes infused in milk, and used in coughs, etc.

DROSERA.

Preparation.—Tincture of Drosera.

Dose.—From the fraction of a drop to five drops.

Therapeutic Action.—I use Drosera as a specific in the cough attending and following measles, especially where there is dryness of the respiratory mucous membranes. An experience of twenty years with it, in a large number of cases, has given me great confidence in the remedy.

We also use it in cases of whooping cough, especially where there is dryness of the air-passages, and much irritation of the nervous system. Whilst it is not a remedy for all cases of whooping cough, it is a true specific in those to which it is adapted. I have often seen a serious case of the disease relieved in twenty-four hours, and an entire arrest of the cough in two weeks.

We also employ it in cases of chronic cough, with dryness of the air-passages and nervous irritation, with much advantage. It makes little difference whether it arises from bronchial irritation or inflammation, or phthisis, if associated with irritation of the basilar portions of the brain and pneumogastric.

ALLIUM CEPA.

Therapeutic Action.—The Onion is expectorant, stimulant, diuretic, rubefacient and discutient. In medicine it is principally employed for its expectorant and discutient properties. As an expectorant we consider it far superior to many of the remedies in common use in colds, catarrh, bronchitis, etc., especially in children. We know of no better remedy in a common cold, incipient laryngitis, croup and bronchitis, than a strong infusion of the onion, sweetened with sugar, or the expressed juice, mixed with sugar. The juice of the roasted onion, mixed with sugar, is also frequently used to check cough in disease of children.

CATALPA.

PREPARATION.—Tincture of Catalpa.

DOSE.—From two to ten drops.

In small doses the tincture of Catalpa relieves irritation of the bronchial tubes, and gives freedom to respiration. It has been used in asthma with marked success, and is also recommended in chronic bronchitis, and in some forms of functional heart disease.

LIQUIDAMBAR.

THE CONCRETE JUICE OF LIQUIDAMBAR STYRACIFLUA.

DOSE.—The dose of Liquidambar is from grs. x. to grs. xx., three or four times a day.

THERAPEUTIC ACTION.—Liquidambar is expectorant, antispasmodic, and diuretic. We have employed it latterly in asthma, chronic bronchitis, and laryngitis, and with marked advantage in some cases. It appeared to relieve the spasmodic action in Asthma—checking the cough and increasing the mucous secretion. We have yet seen no permanent cures effected by it, it merely acting as a palliative. In chronic laryngitis and bronchitis, especially when accompanied with excess of secretion, or when the secretion is entirely suppressed, with a dry, hacking cough, it has proved an excellent remedy.

Dr. Hart, in describing this article, says: "Like other balsamic juices it has been found to act principally upon mucous tissues, and hence has been recommended as a stimulating expectorant in coughs, chronic catarrh, bronchitis, and other pulmonary affections. It has also been employed in gonorrhœa, leucorrhœa, and gleet. It is said that, melted with tallow or lard, it forms an elegant and valuable ointment, which has proved highly beneficial in hemorrhoids, ring-worm, psora, and many other cutaneous diseases, and is also useful as a stimulating dressing to indolent ulcers. The leaves possess powerful astringent properties, but I have never known them used internally with this view. When chewed they speedily dry up fever-sores on the lips and ulceration of the mouth. In such cases they constitute a very popular remedy.

HELIANTHUS.

THE SEEDS OF HELIANTHUS ANNUUS.

PREPARATION.—Syrup of Helianthus.

DOSE.—From half a drachm to two drachms.

THERAPEUTIC ACTION.—Sunflower seeds are expectorant, diuretic and demulcent. As an expectorant, they may be employed in all cases where it is desirable to quiet irritation and relieve cough; they also exercise a considerable influence in controlling inflammation, and give tone to the mucous membrane of the air-passages.

The expressed oil has been administered in the same cases; it may be combined with sugar and used in the form of electuary. It is said to be a very powerful diuretic. The pith of Sunflower contains more or less nitre according to the situation in which it grows, and has been used as a moxa. The leaves are said to be astringent.

TOLUTANTUM.

DOSE.—From ten to thirty grains, made into emulsion with sugar and gum.

Balsam of Tolu acts as a stimulant tonic, and at the same time exercises a specific influence over the secretory functions of the lungs. It is employed with some advantage as a stimulating expectorant in chronic affections of the bronchial mucous membrane, unattended with inflammatory action. In the chronic catarrhal affections of aged or debilitated persons, humoral asthma, phthisis, etc., Balsam of Tolu is often used. It is often used as an adjunct to pectoral mixtures, owing to its agreeable flavor and odor.

The inhalation of the vapors of the ethereal solution in chronic bronchitis, phthisis, chronic catarrhs and other pectoral diseases, is often productive of great relief and decided advantage.

Lozenges made of Tolu are useful in allaying chronic coughs. It is sometimes used by confectioners as a flavoring agent, and as a constituent in articles of perfumery.

SPIRITUS PYROXILICUS.

Therapeutic Action.—It is expectorant and sedative. We have employed the Pyroxilic acid with much benefit in irritation of the air-passages, to check the harrassing cough and promote expectoration. We use the following combination: ℞. Pyroxilic Spirit, ʒij., Honey, ℥ij., Water and Dilute Alcohol, *aa.*, f℥j.; mix. The dose is a teaspoonful every three, four, or five hours. We have employed it as a palliative with the greatest advantage, in phthisis pulmonalis, and as a curative agent in chronic bronchitis, with deficient secretion. Though it, like other agents, will not always succeed in quieting the cough, yet it is worthy the attention of the profession.

AMMONIACUM.

Dose.—From ten to thirty grains, in the form of pill or emulsion.

The effects of this gum resin are similar to, though less conspicuous than those of asafœtida. It is principally used as an internal agent, with a view to its excitant expectorant properties, in chronic pulmonary affections. It is not suited to irritated states of the bronchial mucous membrane.

Chronic coughs with deficient expectoration, asthmatic affections and chronic catarrhs of old debilitated patients, attended with profuse secretion, dependent upon debility of the vessels, are diseases in which it has proved most beneficial.

BENZOINUM.

Dose.—From ten grains to half a drachm.

Benzoin acts as a stimulating expectorant. It is quite liable to disorder the stomach. It is a heating and stimulating agent, affecting mucous surfaces mostly, but the air-passages are the parts more especially influenced by its exhibition It is acrid, and in some cases has appeared to excite the genital organs. The employment of Benzoin is principally confined to chronic pulmonary affections, and more especially those affecting the bronchial mucous membrane. Owing to its excitant qualities it is inadmissible in inflammatory states of the system, and its acridity renders it objectionable in gastric irritation.

STYRAX.

Dose.—From ten to twenty grains, in the form of pills, twice a day, and the dose increased.

Styrax produces the effects of the preceding balsamic substances. It acts as a special excitant to the pulmonary mucous membrane. It is analogous in its effects to the Peruvian balsam and benzoin. It is a stimulating expectorant, and was formerly employed in "phthisis, chronic catarrh, asthma, and amenorrhœa." It has likewise been used in chronic catarrhal disease of the genito-urinary membrane, and applied topically to foul and indolent ulcers, in the form of an ointment.

ACIDUM BENZOICUM.

Dose.—From ten grains to half a drachm, dissolved in a large quantity of water, to prevent its irritant action on the fauces. Its solubility is much facilitated by giving it in union with phosphate or biborate of soda.

Benzoic Acid acts as a general excitant, and locally as an irritant to the mucous membrane of the bowels. Although formerly highly esteemed as a stimulating expectorant, in chronic bronchial inflammation, at the present time it is seldom used, except in certain pharmaceutical compounds, chronic catarrh, humoral asthma, and a few kindred diseases occurring in debilitated and leucophlegmatic constitutions. As this acid imparts acid qualities to the urine, it has been used with advantage in the phosphatic variety of gravel. It is said to have cured incontinence of urine.

MYRRHA.

Dose.—Grains x. to ʒss. in powder, pill or emulsion. Tincture of Myrrh, gtt. x. to ʒj.

Myrrh possesses stimulant, tonic, expectorant, and emmenagogue properties. It is employed as an expectorant in cases of debility. In cases of excessive secretion from the mucous membranes, unattended with inflammation, but accompanied with atony, it is often highly useful. In chronic bronchitis, phthisis, humoral asthma, and other chronic pulmonary affections, attended with an abundant mucous secretion, but not easily expectorated, it is beneficial.

MARRUBIUM.

Hoarhound is a tonic expectorant, and is not regarded as belonging to the division of excitant expectorants, though noticed under that head. It is much used as a domestic remedy in chronic coughs, phthisis, and other pectoral affections. It is frequently used in acute diseases of the respiratory organs in the form of a warm infusion, with a view to its diaphoretic and expectorant action. It is often used in the form of confection (candied Hoarhound) in coughs and colds.

EUPATORIUM.

Boneset is often used in coughs, colds, and pectoral affections. It is valuable in chronic pulmonic diseases accompanied with debility. Boneset, Asclepias, and Sanguinaria constitute an efficient and valuable expectorant preparation in the various forms of acute pneumonic affections. The reader is referred to tonics for a full description of its medical properties.

Eupatorium Aromaticum., or White Snake-root, is likewise valuable as an expectorant and diaphoretic in pleurisy, pneumonia and bronchial inflammation. It is used in the form of warm infusion either alone or in combination with Asclepias and Sanguinaria.

ICTODES.

The root of the Skunk Cabbage is frequently used as an expectorant in the form of infusion, syrup, powder or tincture, in chronic bronchial irritation, phthisis, chronic coughs, asthma, etc. It possesses antispasmodic properties, and in large doses produces emesis and acts as a narcotic. It is combined with Ipecacuanha, Arum, Sanguinaria, etc., as an expectorant and pectoral. The powdered root may be mixed in honey, molasses, or simple syrup, (See Antispasmodics.)

ASCLEPIAS.

Pleurisy-root is an excellent expectorant and diaphoretic, but quite free from stimulating properties. It is recommended in coughs, colds, pectoral diseases, both acute and chronic. It is an excellent adjunct to Sanguinaria, Senega, Lobelia, and other acrid expectorants. It is used in the form of infusion, decoction or powder. (See Diaphoretics.)

INULA.

Elecampane, elsewhere noticed (see Tonics), is a stimulating expectorant, and as such is used in chronic catarrhs and other chronic pulmonary affections, accompanied with general debility and a profuse secretion from the bronchial mucous membrane.

ALLIUM SATIVA.

Garlic is stimulant and promotes most of the secretions. It is employed in old chronic catarrhs as an expectorant, with the view of exciting the debilitated vessels of the lungs, also in humoral asthma, spasmodic coughs, etc.

POLEMONIUM.

Dose.—Of an infusion of the root, bruised, one ounce to one pint of boiling water, from one to four ounces. Of the tincture, from ten drops to half a drachm.

The root of the Polemonium Reptans, or Greek Valerian, is expectorant and diaphoretic. It is one of our most valuable indigenous remedial agents. It is valuable in chronic bronchial inflammation, chronic and troublesome coughs, humoral asthma, phthisis and chronic hepatitis, etc. It has been so highly esteemed by many in phthisis and chronic pulmonic affections, that it has received the name of "Consumption Root."

CHONDRUS.

Irish Moss is esteemed highly useful in pulmonary affections for its nutritive, demulcent, expectorant, and easily digestible qualities. Phthisis, acute and chronic, pulmonic inflammation, catarrhs, acute and chronic dysentery and diarrhœa, irritation and inflammation of the urinary organs, scrofula, rachitis, enlarged mesenteric glands, etc., are the diseases in which it is mostly used. As an article of diet it is valuable, being easily digestible, appropriate in all cases in which tapioca, sago, barley, and other farinaceous preparations are used. As a culinary article it is substituted for jellies, soups, etc. It is generally employed in the form of decoction or jelly.

CETRARIA.

Iceland Moss, although noticed under the class of expectorant remedies, is used more on account of its demulcent and tonic properties than any expectorant qualities which it possesses.

It is highly mucilaginous or demulcent, nutritive and tonic, and well adapted to inflammatory states of mucous surfaces, especially those of the respiratory passages. It has been found useful in chronic catarrhs, phthisis, and other pectoral affections attended with copious expectoration of a purulent character. It is useful in the debility of acute diseases where there is great exhaustion of the vital powers, or where there is gastro-intestinal irritation. It is recommended in the exhausted states of the system, incident to copious discharges from external ulcers. It has been favorably noticed in hemoptysis, and was at one time thought to be of especial service in consumption. Its utility now is believed to depend upon its mild tonic, demulcent and nutritious properties, and not upon any specific powers over the disease; and reputed cures are now believed to have been cases of chronic bronchitis.

ACACIA.

Gum Arabic is demulcent, expectorant, and nutritive. It is used to allay inflammatory action existing in the air-passages, digestive tube, or urino-genital mucous membrane. It soothes the inflamed mucous surfaces of the respiratory passages, and promotes expectoration. It is a popular remedy in coughs and catarrhal affections; it shields the membrane from the atmosphere and other mucous surfaces from the action of acrid or irritating medicines.

GLYCYRRHIZA.

Licorice-root is mostly employed as a demulcent expectorant in acute inflammation of the respiratory passages. In acute bronchitis, chronic catarrhs, pneumonitis, pleuritis, etc., it is useful to allay the irritable and inflamed state of the mucous surfaces, whether used as an independent remedy, or associated with other remedies.

LINUM.

Flaxseed is demulcent and emollient, and is considered expectorant and nutritive. The mucilage is employed in coughs, colds, bronchial irritation and inflammation; also in gastritis, dysentery, strangury, nephritis, calculous complaints, and all similar diseases of the mucous surfaces. Although not possessed of any positive expectorant powers, yet it is very serviceable in allaying cough, irritation and inflammation in the fauces, larynx, trachea, bronchia, etc. It serves to soothe and allay the irritated action, and thus favors expectoration.

SYMPHYTUM.

Comfrey possesses demulcent, pectoral, emollient and astringent properties; but is chiefly valuable as a demulcent. It is much used in irritated or inflamed states of mucous surfaces. Among the various diseases of this character in which it is used, may be named dysentery, gastritis, bronchitis, pneumonitis, nephritis, cystitis, etc. It has been found useful, in hemoptysis, in phthisis, coughs, chronic catarrhs, and other pectoral affections; also in leucorrhœa. It is mostly employed in the form of syrups, combined with other pectoral agents, as Aralia, Sanguinaria, Senega, etc.

CONVALLARIA.

Solomon's Seal, described under the class of Demulcents, is frequently administered in coughs, chronic bronchitis, phthisis, and other pectoral complaints. It is esteemed useful in fluor albus, and in immoderate menstruation. It enters into pectoral syrups and various restorative compounds.

TOPICAL EXPECTORANTS—INHALATIONS.

Various are the agents employed in the form of inhalations, and very decided are their therapeutic effects in many cases. Phthisis, acute bronchitis, and acute and chronic laryngitis, chronic catarrh, spasmodic asthma, spasmodic coughs, dyspnœa, etc., may be enumerated among the diseases affecting the respiratory passages, in which inhalations often exert a salutary influence. Certain forms of asthma are supposed to depend upon a paralysis, or some morbid condition of the pneumogastric nerves. By the process of inhalation the medicated liquid or gas is brought in direct contact with the affected nerves, should any be disordered, the fauces, larynx, trachea, bronchia, and their minute ramifications in the lungs and the air-cells.

From this it is apparent they are the only means by which we can apply our remedies directly to the affected part. Agents of both an *excitant and sedative* character are employed in different cases, according to the different pathological conditions that may exist.

EXCITANT INHALATIONS.

BENZOINUM.

Benzoin is employed as an excitant inhalation in asthma, phthisis, chronic catarrhs, chronic laryngitis, etc. Several eminent writers have strongly recommended it in the latter disease. The atmosphere of the patient's room is to be impregnated with its vapor by burning it on live coals, and repeating this process for many weeks, or even months, or it may be added to boiling water and its vapor inhaled in this manner.

TOLUTANUM.

Balsam of Tolu may be employed in precisely the same manner recommended for the employment of Benzoin, and in a similar class of diseases. The vapor arising from the ethereal solution has been resorted to with great advantage in chronic bronchitis, phthisis, chronic catarrhs, and other kindred affections of the respiratory passages.

ACETUM DISTILLATUM.

Or the common Vinegar, may be properly diluted with water or some medicated aqueous liquid, then heated and its vapor inhaled through the spout of a tea-pot, coffee-pot, or an apparatus constructed purposely, in the various laryngeal tracheal and bronchial affections already alluded to.

PIX LIQUIDA.

Tar has proved highly serviceable in many cases of chronic bronchial and laryngeal disorders, used both in the form of inhalations and as an internal agent. It often affords relief in chronic laryngitis, and like results have followed in chronic bronchitis, and even in phthisis it has proved useful as a palliative when employed topically. A superficial vessel containing tar may be placed over a spirit-lamp, or a water-bath may be employed in order to cause the fumes or vapor to be constantly evolved and the atmosphere of the patient's chamber constantly impregnated with a medicated vapor.

Aqua Picis Liquidæ. — Tar, Oij., water, cong. Oj.; mix, stirring with a wooden rod, for fifteen minutes. After the tar subsides strain the liquor, and keep in well-stoppered bottles.

Stimulant, diuretc, pectoral, and used in chronic catarrhs, urinary disorders, and sometimes as a wash in chronic cutaneous diseases. One or two pints may be taken in the course of the day.

CREASOTUM.

Creasote has been inhaled in the state of vapor in broncorrhœa, phthisis and chronic bronchitis, as a direct excitant to the mucous surfaces of the respiratory passages, assisting the excretion of the accumulated mucous, or perhaps promoting the function of the secretory vessels when deficient from atony. The vapor may be inhaled by means of the ordinary inhaling bottle, or twenty or thirty drops may be added to one quart of warm water, and the vapor inhaled through a tube introduced into a closely covered vessel or through the stopper of a bottle, or even through the spout of a coffee or teapot.

RESINA.

Resin is employed occasionally as a topical expectorant in the various laryngeal, bronchial and pectoral affections named under the head of Pix Liquida. It is to be burnt upon live coals, or in some tin or earthen vessel over a lamp, in order to impregnate the air of the patient's room with its fumes.

Blotting or common brown paper, that has been thoroughly soaked in a saturated solution of the nitrate of potassa, dried and smoked in a common tobacco pipe during asthmatic paroxysms, is in many cases productive of great good, by promptly alleviating the distressing dyspnœa and other urgent symptoms.

The vapor of hot water, vinegar and water, spirits and water, or many medicated aqueous fluids, is often productive of great good when repeatedly and perseveringly inhaled in tonsillitis and other anginose affections, as laryngitis and trachitis; also in bronchitis, pneumonitis, phthisis, etc. In many cases they may act only as palliatives, while in others they may prove valuable auxiliaries or even curative. Among the various articles employed in the form of inhalation that are boiled in simple water, vinegar and water, or some alcoholic liquid and water, and the vapor thus afforded inhaled, with a view to the excitant influence upon the bronchial mucous surface, or with a view to the bland, mild and emollient influence of the warm vapor,—may be named Chamomile, Hoarhound, Boneset, Mullein, Catnip, Mayweed, Sage, Hyssop, Elecampane, and sundry other articles which it would be superfluous to name. Perhaps the advantage supposed to be derived from these medicated vapors is more imaginary than real; the real advantage being dependent upon the mild, bland, soothing, relaxant and emollient influence of the gentle warmth brought in direct contact with the tense, irritated, inflamed or ulcerated surfaces within every portion of the respiratory tube. At all events, their utility can not be questioned in many of the cases named.

SEDATIVE INHALATIONS.

By a Sedative Inhalation is meant one, that, owing to the sedative or narcotic properties of the ingredients, relieves the irritation of the air-passages by its influence upon the nerves distributed to the mucous membrane. They are sometimes employed by smoking in a common tobacco-pipe ; in this way the Digitalis, Stramonium, Conium, Belladonna, tobacco, etc., have been found beneficial in asthma, coughs arising from irritation of the pneumogastric nerve, etc. The Digitalis was formerly thought by some to be almost a specific in certain forms of asthma.

We may employ any of the sedative or narcotic agents in tincture, solution, infusion, or decoction, as inhalations.

The apparatus for atomizing fluids, is now so perfect and so cheap, that patients can have them for their own use. For some cases the steam atomizer (Codman & Shurtliff's) will be the best, but for many others the air bulb will be quite as good. This method is especially applicable in chronic catarrh, the remedies being principally from the class Antiseptics.

DIVISION VIII.

CLASS XV.

ANTISEPTICS

By the term antiseptic is meant any agency which counteracts sepsis or putrefaction. Those agents, therefore, which are supposed to possess the power of destroying or counteracting the septic or putrescent tendency in the system, are termed *antiseptics*.

This term is so frequently employed by our standard writers on materia medica and therapeutics, to designate a property of medicines, without defining what is meant by such property, or why certain agents act in this manner, that we have ventured upon an innovation in this work, which many may think is not demanded by the present state of medical science or the wants of the profession. Whatever may be the views of others upon this subject, we deem a description of the agents supposed to possess this property, their mode of action, and adaptation to the relief of those states of the system termed septic or putrescent, of sufficient importance to warrant a chapter on this subject.

That there does exist in many instances during the progress of disease, a tendency to putrefaction or rapid decomposition within the system, no physician we think will pretend to deny. Sometimes this tendency exists in the whole system as is evinced by the general atony and extreme debility that prevails; by the vitiated state of all the secretions; by the dissolved state of the blood; by the cadaverous effluvia escaping from the body of the patient; as well as by the languid and unequal circulation, involuntary discharges, and many other symptoms unnecessary to name. These symptoms are observed in the malignant fevers, especially in the aggravated forms of typhus and typhoid, and in some cases of scarlatina maligna, and confluent small-pox.

Gangrenous erysipelas, puerperal fever, many local injuries, surgical operations, etc., may be adduced as instances of local disease in which a septic or putrescent tendency often exists, rendering specific treatment for its counteraction indispensable.

For convenience, and the better understanding of this subject, we will make the following division of this class of agents: 1. Tonic antiseptics; 2. Stimulant antiseptics; 3. Astringent antiseptics; 4. Chemical antiseptics.

Hooper does not recognize the two latter divisions—astringent and chemical agents; while he adopts two other classes—the antispasmodic and refrigerant antiseptics. The antispasmodic antiseptics that he names,—camphor and asafœtida,—prove serviceable, as we believe, by their stimulant properties, producing a temporary exaltation of vital action, and not by that influence usually termed antispasmodic; and therefore we regard such a division as erroneously founded. His division of *refrigerant* antiseptics likewise appears to be erroneous. Those agents which he names under this division, to wit, acids, counteract a septic tendency; but the question is do they do so from their refrigerant action. We think that this effect is due in part to their restorative powers, and in part to their chemical influence.

We can not therefore regard the division of this class of agents into antispasmodics and refrigerants, as being based on a correct pathological view of septic diseases, nor of the therapeutic action of these agents. Although there may be objections urged against the views which we hold upon the subject, yet we believe they will be found to accord better with our present knowledge of medical science, than any others which have heretofore been advanced.

I. *Tonic Antiseptics.*—As a septic tendency is unquestionably connected with, or directly dependent upon a depressed state of the vital forces, whether the depression be general or local, it is obvious that those agents which tend to increase the strength and vitality of the system, are those upon which much if not our chief reliance should be placed.

Tonics having this power, have accordingly been exhibited with great freedom to ward off or counteract the existing or anticipated morbid state or septic condition. Hence the use of the Peruvian bark and its preparations, the cornus florida, hydrastis, etc., in such cases. Many of the tonics possess timulant and astringent qualities also, to which undoubtedly may be ascribed additional antiseptic powers, whether the agent be employed as a general or topical remedy.

By increasing digestion and assimilation they furnish a healthy material for the formation of blood; and it is probable that they also exert a direct influence when in the blood, upon those parts of it which have not yet lost their vitality—preventing the progress of the septic tendency. Any measures that will increase or give strength to the vital force of the system, enabling it to resist chemical changes, will prove most powerful antiseptics.

II. *Stimulant Antiseptics.*—Stimulants prove antiseptic in a similar manner to tonics: that is, they temporarily increase innervation, and thus strengthen the vital powers of the system. The extreme depression produced by a septic condition of the blood, depends in part upon its paralyzing influence upon the nervous centers; stimulants counteract this depression by giving rise to an increased evolvement of nervous energy. These agents, however, to prove beneficial, should be combined with tonics, so that the favorable impression produced may be rendered permanent.

They also give an increased *vis a tergo* to the circulation, and probably by this means they may favor the excretion of the morbid material. In this way brandy, wine, and other alcoholic liquors, as well as many of the vegetable stimulants, as serpentaria, myrrh, capsicum, camphor, etc., prove beneficial.

III. *Astringent Antiseptics.*—This division is not as well marked as the preceding, but there are so many articles possessing this property whose principal action seems to be owing to their astringency, that we have thought the arrangement here adopted fully warranted. These agents are principally used topically. Of this class we may name the barks of the different species of oak, hemlock, the sumach, marsh rosemary, wild indigo, etc. Perhaps many of the agents employed for this purpose, and belonging to this division, are dependent for their value, in part, upon some tonic or stimulant influence which they may exert. The mineral agents, as the sulphate of zinc, alum, etc., used as antiseptics, may likewise owe part of their influence to their astringent and stimulating properties, as well as to their chemical influence.

Astringents act as topical antiseptics by causing a condensation of the relaxed tissues, and imparting a normal degree of tone to the parts.

IV. *Chemical Antiseptics.*—The antiseptic action of many remedies can not be accounted for in any of the three ways named; and the question now arises, how do such agents operate? We have no doubt that they act chemically upon the parts undergoing decomposition, although it may be impossible to give a clear and philosophical explanation of this intricate subject.

Sepsis or decomposition is a chemical change, a breaking up of the complex molecules which form our bodies, and the formation of less highly organized and vitalized compounds. So long as the vital force exists in normal strength, this chemical change is held in check; it is exerted just far enough to break down the worn-out tissues of the body. But as soon as the vital force is greatly weakened, this chemical change assumes greater intensity. "The influence of poisons and of remedial agents on the living animal body evidently shows that the chemical decompositions and combinations in the body, which manifest themselves in the phenomena of vitality, may be increased in intensity by chemical forces of analogous character, and retarded or put an end to by those of an opposite character; and that we are enabled to exercise an influence on every part of an organ, by substances possessing a well defined chemical action."—(*Liebig.*)

Having established the point that there is a chemical action going on incompatible with the living principle or laws of life, is it not self-evident that any agent possessing a sufficient degree of chemical power to counteract the existing change, will arrest putrescency. If there is a putrescent or septic secretion, the chemical agent may neutralize and destroy its poisonous action upon other parts, as fast as secreted, and thus prevent the propagation of the septic tendency.

Among the many agents belonging to this division may be named the mineral acids, pyroligneous acid, creosote, sulphate of zinc, chlorine and its salts, carbonic acid gas, niter alum, carbo ligni, yeast, alcohol, sugar, etc. That some of these agents act in other ways is not to be denied; nevertheless their chemical action is believed to be the most important.

In Hooper's description of antiseptics, although he does not positively ascribe their curative powers to their chemical action, yet the reader can not but infer from the following quotations, that such are his views respecting some agents at least.

"The presence of air, though not necessary to putrefaction, materially accelerates it; and those gases which contain no oxygen are very efficient in checking, or altogether preventing the process. Carbonic acid also remarkably retards putrefaction; and if boiled meat be carefully confined in vessels containing that gas, it remains unchanged for a very long time, as seen in Mr. Appert's method of preserving meat."

"There are many substances which, by forming new combinations with animal matter, retard or prevent putrefaction: such as chlorine, and many of the saline and metallic compounds; sugar, alcohol, volatile oils, acetic acids, and many other vegetable substances, also stand in the list of antiputrefactives, though their mode of operating is by no means understood."

The earths and salts are antiseptics, and probably act by absorbing the acids formed in the process of putrefaction. Carbon or charcoal of wood is one of the most powerful antiseptics, and probably not only acts by preventing oxygenation of organized matter, but also in a manner similar to that just described above. It will restore tainted meat, and purify offensive water. Casks are now charred to contain water on long sea voyages, and it will continue pure and sweet in them for a long time. Charcoal in powder is successfully used in the cure of looseness of the bowels, and it has been known to cure intermittent fever.

Carbonic acid, chlorine, the saline and metallic compounds, acetic acid, etc., to which reference is made in the above quotations, are denominated antiputrefactives, and if so, how do they act, if not chemically? The new affinities which arise from their application, and the new combinations formed by their union with the products generated by decomposition, may so change the character of the decomposing material, as to prevent the communication of the destructive process to the still vitalized tissues. That such chemical changes and reactions do occur in the body is not doubted; and to this action, and this alone, are we to refer for a satisfactory explanation.

"Warmth, air and moisture," says Pereira, "are the most powerful agents in promoting putrefaction, and their exclusion, therefore, is among the most effective antiseptics. Thus, cold, a vacuum and desiccation, are good conservatives of dead organic matters. Alcohol, sirups, fats and volatile oils are antiseptics; all act by excluding air, and some of them (alcohol) likewise by abstracting water from the organic matter."

The study of microscopy has shown that in all putrefactive processes there is developed certain micro-organisms, either vegetable or animal, and that this development keeps pace with the putrefaction. Whether the micro-organisms are the cause of the sepsis, or the result of it, is a disputed question, but the experiments of Tyndal, Pasteur, and others, would go to prove that some forms of decomposition are due to the presence of these germs, and their rapid development.

An organized body which will undergo rapid decomposition if exposed to air containing these germs, will not undergo putrescence, if these germs are excluded. A wound exposed to an air containing the germs of these micro-organisms, will suppurate freely and the tissues will lose life and maybe slough, whilst under an antiseptic dressing there will be little pus formation and a rapid repair. Whether the modern doctrine that putrescence is due to the presence of these micro-organisms, is correct, or not, it is true that the antiseptic dressing of wounds and injuries is a great advance in surgery.

In the consideration of the agents employed, we will adopt the more modern classification into antizymotics, and antiseptics. Some remedies belong alike to both classes, and may be used internally or locally, others belong to but one.

Antizymotics are internal remedies which antagonize zymotic poisons, and the putrefactive processes of zymosis. Certain causes of disease, from their tendency to sepsis of the blood and tissues, have been termed zymotic, and the impairment of life which follows and which is inclined to propagate itself, is called zymotic. Typhoid symptoms are characteristic of these diseases. Exudations from the blood are dirty or dark-colored. As we usually look at the tongue to obtain this evidence, we find it *dirty*, or dark-colored—shades of brown and black. Typhoid and typhus fever, diphtheria, spotted fever, some forms of erysipelas, the severer types of small-pox, scarlet fever and measles, puerperal fever, typhoid pneumonia, and typhoid dysentery, are examples of this class of disease.

Antiseptics arrest the process of sepsis by their topical action, either destroying the septic poison, or the septic germs, or strengthening the tissues to resistance. The majority exert a chemical action upon devitalized tissues or secretions, and will prevent putrescence if admixed with an animal substance not outside of the body.

Some of them may be called *disinfectants*, and are employed to destroy septic material and germs in the atmosphere, or in houses, drains, cellars, or even the earth around dwellings. These are of very great importance in preventing the propagation of disease, and in stamping out infectious and zymotic poisons.

ANTIZYMOTICS.

SODII SULPHIS.

Dose.—This remedy is given in doses ranging from grs. j. to grs. xxx.

Specific Indications.—The indications for Sulphite of Soda are a broad, *pallid*, *dirty* tongue. The pallor is of the tissues of the tongue, the coating or fur is dirty, usually whitish or yellowish, and thick and moist.

Therapeutic Action.—With these indications Sulphite of Soda is one of the most direct remedies we possess. It arrests the septic process, lessens the nervous excitation, slows the pulse, reduces the temperature, favors excretion, cleanses the stomach and bowels, and favors digestion.

It makes no difference what the name of the disease is, or where it is located. It may be an ague, remittent fever, typhoid fever, small-pox, pneumonia, dysentery or diarrhœa, its curative influence is equally marked. In some cases it seems to fill all the indications for treatment, in others it prepares the way for remedies which influence the various functions of life.

As a local remedy it is not frequently used, but occasionally it may be employed with good results. We would select those cases in which wounds or ulcers secreted a dirty pus, and the tissues were pallid and enfeebled.

MAGNESII SULPHIS.

DOSE.—From two to ten grains.

THERAPEUTIC ACTION.—Following the same indications we would use Sulphite of Magnesium in cases showing typhoid or zymotic symptoms, the tongue having the same nasty coating, but not being so pallid. There are also cases in which the stomach will not tolerate the salt of soda, but will receive the Magnesium kindly.

It may be employed in all cases of disease when these indications present, and will be found a most excellent remedy.

Bisulphite of Sodium.—Dose, grs. v. to grs. xx.

Sulphite of Potassium.— Dose, grs. v. to ʒss., in weak solution.

Sulphite of Ammonium.—Dose, grs. j. to grs. v.

Sulphite of Calcium.—Dose, grs. j. to grs. v.

These sulphites have a similar antizymotic action and may be employed in somewhat similar cases. The Bisulphite of Soda is the same as Sulphite of Soda. Sulphite of Potash will be chosen where mucous membranes have a bluish color, and where there is muscular tremor. Sulphite of Ammonium is selected when a stimulant is required, or where there is a tendeney to convulsive action. Sulphite of Calcium may be selected where there is inflammation of cellular tissue, or furuncular disease of the skin.

SODII SULPHOCARBOLAS.

Dose.—From five to twenty grains.

Therapeutic Action.—Sulpho-carbolate of Sodium may be employed in similar cases to the sulphites just described. It is claimed that carbolic acid exerts a very direct influence in controlling the temperature, as well as in opposing the septic process. And this combination is thought to possess the properties of carbolic acid in a full degree. It has been recommended in typhoid, typhus and scarlet fever, and especially in typhoid pneumonia, and when there is a low grade of deposit. It has also been employed with reported good success in the treatment of phthisis pulmonalis.

ACIDUM SULPHUROSUM.

Dose.—From ten drops to one drachm.

Specific Indications.—Sulphurous Acid is indicated by a tongue of ordinary redness showing a glutinous nastiness, yellowish brown in color on its surface. Tissues look as if they had lost vitality, deep red, and as if they might slough. The tongue sometimes looks as if fecal matter had been rubbed over it.

Therapeutic Action.—With these indications, Sulphurous Acid becomes one of our best antiseptics. We employ it in the advanced stages of remittent fever, in typhoid fever, typhoid pneumonia, typhoid dysentery, scarlet fever, smallpox, diphtheria, puerperal fever, and in surgical fevers.

It is a very serviceable topical remedy in cynanche maligna, in scarlatina maligna, and in diphtheria where the mucous membranes show dusky coloration. We use it as a gargle, or with the air-spray apparatus.

It is also a good remedy in vesicular and pustular disease of the skin, taken internally in full doses, and used as a wash.

ACIDUM MURIATICUM.

Dose.—For ordinary use it is added to water so as to make a pleasant acid drink, and given freely.

Specific Indications.—The tongue is deep-red, dry and contracted, and has a brownish coating. Or it is deep or dusky red, moderately full, slick, and looks like a piece of spoiled beef.

THERAPEUTIC ACTION.—The symptoms above named are common in the advanced stage of continued fevers, and in other diseases which develop typhoid symptoms in their progress. In some years and in some localities, the deep-redness, and brown coating of the tongue is the common feature of disease, and the acid treatment is the best that can be employed.

Anstie & Chambers, of England, report some hundreds of cases of typhoid fever treated with acids alone, with good food (usually milk), good air, cleanliness and good nursing, in which the mortality was below four per cent., and in one year dropped down to one per cent. If a physician should have but one death in twenty, in a season of typhoid fever, he would think himself doing remarkably well. Many take a great deal of credit where they have but one death in five.

Let it be remembered that whenever an acid is indicated by the deep redness of the tongue, it will be a part of a good treatment. Whether the disease is a fever of low grade, an inflammation of the lungs, a dysentery or a diarrhœa, it is alike beneficial.

When a dilute muriatic acid can not be taken, lactic acid in the form of whey, or a good sharp cider may be given in its place.

BAPTISIA.

THE LEAVES AND BARK OF THE ROOT OF BAPTISIA TINCTORIA.—U. S.

PREPARATION.—A tincture of the bark of the fresh root.

DOSE.—From the fraction of a drop to five drops.

SPECIFIC INDICATIONS.—The face is full and purplish, like one who has been long exposed to cold. There is the same fullness and coloration of tongue and fauces.

THERAPEUTIC ACTION.—With these indications, Baptisia is one of the most certain of antiseptics. We employ it in continued fever, in remittent fever when typhoid symptoms are developing, in scarlet fever, and in dysentery and diarrhœa. In many cases of disease, the indications for Baptisia will be pronounced the first day, and the remedy is given at once, without waiting for other evidences of sepsis or putrescence. This, of course, is true of all the remedies we have considered, though many times they are not given until a more advanced stage. An early administration of the proper antiseptics can not be too strongly urged.

In high grades of inflammation of the bowels or other internal organs, with a tendency to gangrene or mortification, Baptisia enjoys a high reputation. It is often resorted to as a gargle in diseases of a putrid character, affecting the throat. In scarlatina maligna, angina maligna, and in the malignant forms of variola affecting the fauces, and also in ulceration caused by mercury, and in all the ordinary forms of ulceration of the mouth and throat, this agent answers an admirable purpose as a gargle.

It is valuable as a topical agent in cases of syphilitic ulcers, and in white-swellings and fever-sores; in phagedenic, foul, fetid, and gangrenous ulcers, also in sore nipples, chronic and scrofulous ophthalmia, fetid leucorrhœal discharges, whether attended with ulceration of the genital organs or not. It acts as a topical tonic and gentle excitant to the vessels and parts implicated in the ulcerated process. For external purposes it may be employed in the form of a cataplasm, fomentation or decoction. The cortical portion of the root may be pulverized and mixed with slippery elm and applied as a poultice to foul and gangrenous ulcers and parts, or it may be bruised and used as a fomentation, or a strong decoction may be prepared and cloths dipped in it, and applied to the affected part; or the same may be used to cleanse fetid and putrid ulcers, while at the same time advantage may be derived from its internal use. In cases of apprehended or existing gangrene of the bowels, cloths should be dipped in the strong decoction and frequently applied to the bowels, and at the same time the patient should take the decoction internally. An ointment, prepared by simmering it in cream, has been found beneficial in sore nipples and ulcerated breasts.

POTASSII CHLORAS.

DOSE.—The dose will range from grs. ij. to grs. xx.

SPECIFIC INDICATIONS.—The odor is like decomposing flesh. The odor from an offensive lochial discharge (putrescent), and from cynanche maligna, is the typical indication. Mucous membranes are bluish white, and the coating of the tongue thick and dirty.

THERAPEUTIC ACTION.— Chlorate of Potash has been largely employed as an antiseptic, and many times with excellent results. Yet physicians have been surprised at the want of uniformity in its action, and the occasional unpleasant results which they have been loth to attribute to the medicine. It is a very good remedy when indicated—none better; it will sometimes do much damage, if contra-indicated.

We find a prominent place for it in obstetric practice, and it seems to be *par excellence* the remedy for putrescence in uterus or vagina. As already remarked, the odor is so characteristic that there can be no mistake. Blood is retained, and the lochia becomes offensive; a portion of placenta is retained, and evidence of putrescence is soon manifest; the ordinary discharges become putrescent and are offensive.

In these cases the patient complains of pain and weariness, chills and fever follow. It may be of brief duration, but the blood is poisoned, and there is a slow recovery and impairment of the health for a long time. Or we may have a grave puerperal fever, metritis, or peritonitis, developed from these causes.

Here the old adage, "an ounce of prevention," etc., comes in good play. It is a case of abortion, and despite our efforts the placenta is not found, or a portion of it remains behind. It is a case of labor at full term, and a shred of placenta or membrane, or blood-clot, remains. We know there will be putrescence and blood poisoning, and we provide against it by the administration of small doses of chlorate of potash.

Chlorate of Potash has been given internally in malignant sore throat and in diphtheria, with excellent results. It has also been used in the advanced stages of inflammation showing typhoid symptoms, and in the continued fevers.

It will find a prominent place in surgical fever, if the indications are noted and strictly followed. I recall a case of amputation in which the discharges from the stump had the characteristic odor, the surgical fever assuming a grave type. The patient was relieved by the administration of five-grain doses every two hours.

As a topical remedy, a solution is used in sore mouth, sore throat, catarrh, influenza, ozæna, vaginitis, and gleet. In some of these cases the curative action of the remedy is very decided.

Chlorate of potash is an irritant to the kidneys, and the danger that attends its administration in some cases is due to this. The physician does not note this fact, and makes his usual prescription, and dose by dose the urine becomes scantier, until finally uræmic irritation, followed by coma, is the result. This danger should always be borne in mind, and the remedy used with care.

ANTISEPTICS.

THYMOL.

PREPARATIONS.—For local use it is employed in solution in the proportion of from 1 to 1000, to 1 to 200 parts of water, using a small portion of alcohol to effect the solution. For internal use, 1 to 3000 parts of water, in doses of a teaspoonful to a tablespoonful every two or three hours.

THERAPEUTIC ACTION.—Thymol is one of the most powerful topical antiseptics, and being less irritant and offensive than many others, it is largely employed as an antiseptic dressing. In surgical operations and wounds, the stronger solution may be used as a wet dressing, as a spray, and to moisten the instruments; the solution of 1 to 1000 is thought strong enough.

In many cases the continued application of Thymol prevents inflammatory action, and pus is formed in but small quantity, and there is no surgical fever. When the part is examined under the dressing, it is seen to be of normal color, normal temperature, and free from pain.

It has been employed as a gargle, and with the spray apparatus in diphtheria, and malignant sore throat, in severe tonsillitis, and in acute and chronic catarrh. It has been suggested as a good injection in gonorrhœa, and used with advantage in the treatment of leucorrhœa.

ACIDUM SALICYLICUM.

For internal use, it should be prepared from oil of wintergreen. For external use, it may be prepared from carbolic acid.

DOSE.—Internally, the dose will range from grs. j. to grs. x. It may be given in two grain pills, or in solution, with acetate of ammonium, acetate of potash, or bicarbonate of soda. For external use, I generally employ it with borax, one drachm of each to the pint of water.

THERAPEUTIC ACTION—Salicylic acid is employed as an internal remedy for the cure of rheumatism and has gained considerable reputation. I should select for its administration, cases of sub-acute rheumatism, or the acute disease, with a high temperature, but soft skin, and a bluish tongue, moist. In some years it answers an excellent purpose, but at other times it is of no benefit.

It has been claimed to have marked antipyretic properties, and has been employed in very large doses, as much as twenty grains every three hours. But this use has been found to do more harm than good.

In solution with borax it is one of the best antiseptic dressings I know. Whether it is an injury, a surgical operation, or an inflammation terminating in suppuration, it may be employed with good results. In diseases of bone I have used it for months, with the result of having the tissues clean, but little suppuration, and no offensive odor.

I regard the remedy as antipyic—opposed to pus formation—and I have employed it in many cases for this purpose. In an open wound this influence is so decided that it can not be mistaken, but in internal inflammations, one may doubt it. Yet, I have used it with success in typhlitis and perityphlitis, and in one case of threatened iliac abscess with apparent good results.

We use Salicylic Acid in solution (usually with borax), as a gargle in chronic pharyngitis, with the spray apparatus, in chronic catarrh, and as an injection for leucorrhœa.

ACIDUM BORACICUM.

THERAPEUTIC ACTION.—Boracic Acid is markedly antipyic as well as antiseptic. It allays irritation and stops determination of blood, and thus exerts a favorable influence upon the inflammatory process. Further, it strengthens the tissues, and promotes normal nutrition.

In solution, ten grains to the ounce, it is an admirable collyrium in suppurative conjunctivitis, and in the chronic form of the disease. It is of especial value when the eyes are feeble and irritable, and from this, difficulty in the accommodation of the eyes.

It is an admirable dressing for wounds and injuries, a gargle in pharyngitis, a spray in chronic catarrh, and an injection in chronic vaginitis. It is less irritating than any other of these remedies.

SODII BORAS.

THERAPEUTIC ACTION.—In solution (ʒj. to Oj.), Borax is an excellent antiseptic dressing. It may be used as a spray whilst an operation is being performed, instruments may be wetted with it, and a wet dressing will prevent putrefactive processes, and the generation of micro-organisms.

It is a good gargle in sore throat, a good wash in many cases of sore mouth, a good spray in chronic catarrh, and a good injection in some cases of leucorrhœa.

ACIDUM CARBOLICUM.

PREPARATION.—For most uses we employ a solution of Carbolic Acid, one part to three of glycerine; this may be mixed with water in any desired proportion.

DOSE.—Internally, the dose of this solution of Carbolic Acid, will be from gtt. j. to gtt. x. As an antiseptic dressing, ʒj. to ℥ss. to water Oj.

THERAPEUTIC ACTION.—Whilst Carbolic Acid has an antiseptic action when taken internally, it is so offensive to most persons, and so irritant, that other remedies of this class are preferred.

It makes a good antiseptic dressing, and in the earlier phases of "Listerism" it was the antiseptic employed. During an operation, the part would be continuously sprayed with the solution, instruments would be wetted with it, the operator and his assistants would keep their hands wetted with it, carbolized adhesive plaster employed, carbolized gauze, carbolized lint and bandages used, and a carbolized dressing over all. It was an advance in surgery, and gave greater success than the old methods, but surgeons gave themselves more trouble than was necessary. Now, they rarely use the antiseptic spray, carbolized gauze and lint, and trust to the wet antiseptic dressing.

The full strength Carbolic Acid may be used for the destruction of epithelial cancer, and will sometimes be found preferable to the stronger escharotics. The crystalized acid is warmed to deliquescence, and thoroughly applied with a pine pencil, so as to bring it to the bottom of the growth.

A solution of Carbolic Acid will be found the best dressing for cancer of the uterus and vagina. It relieves pain, removes the fetor, and the malignant growth shrinks in size, and its progress is less rapid. In some cases the full strength solution (one to four) will be found best, in others a weaker solution will be employed. That strength which relieves pain is the one to be employed.

Carbolic Acid is one of our best remedies for the removal of warts. The strong acid is applied to the very base of the growth, with a pine pencil. In two or three days of such application suppuration occurs, and the growth falls off.

Carbolic Acid has been employed as an inhalation, with good results. If the doctrine of tubercle bacillus is established, as taught by Koch, we will find antiseptic remedies of great importance. For inhalation, it is used in small quantity. Carbolized lint or cotton, or a carbolized sponge used as a respirator much of the time serving this purpose.

CEREVISIÆ.

Yeast is a valuable antiseptic, used both internally and topically, in putrid or putrescent grades of disease, when all the secretions and excretions are vitiated and offensive, with a strong tendency to gangrene, or mortification of the bowels or some other portion of the system.

Perhaps its antiseptic power depends upon its chemical action ; at all events it is exceedingly important in correcting any noxious state of the alimentary secretions or accumulations, in typhus or adynamic fevers.

ZINCI SULPHAS.

Sulphate of Zinc is a powerful local antiseptic. Its action as an antiseptic may be explained in part by its astringent and stimulant influence upon the part to which it is applied. It serves to harden or condense the relaxed tissues, by which the caliber of the vessels is diminished, and thus restrains abnormal secretions or passive exudations. It also stimulates the parts to which it is applied, and increases their power to resist decomposition ; it also acts as a desiccant.

As a local antiseptic application, the Sulphate of Zinc is used in solution, from ʒj. to ℥j. to water Oj., according to the severity of the disease, and the parts to which it is applied. To arrest gangrene of the extremities a strong solution is employed.

CHLORINE.

Chlorine gas has been employed, by inhalation, as an antidote for poisoning by hydrocyanic acid, sulphuretted hydrogen, etc., and as a remedy in chronic pulmonary disease. It is but little used.

AQUA CHLORINII.

Dose.—From one to four drachms, largely diluted with water.

Therapeutic Action.—Chlorine water is antiseptic, stimulant and escharotic. A concentrated solution of Chlorine acts as a violent corrosive poison. If less concentrated, it ceases to be a caustic, but still acts as an energetic irritant. If properly diluted, and taken into the stomach, it acts as a stimulant and tonic. Its protracted use is attended with salivation. When applied to dead animal matter it serves to arrest or prevent putrefaction.

Chlorine water is administered in putrid disorders, as in the malignant forms of typhus, scarlatina and angina maligna ; in the two last named diseases it has been highly extolled. It has been employed in disorders of the liver and in venereal affections.

LIQUOR SODÆ CHLORINATÆ.

LABARRAQUE'S DISINFECTING FLUID.

Dose.— From thirty drops to one drachm, diluted with water or some aqueous fluid, and repeated every two or three hours.

THERAPEUTIC ACTION.—The solution of Chloride of Soda possesses antiseptic, disinfectant, stimulant and resolvent properties. This remedy is exhibited in putrid or malignant diseases, as scarlatina maligna and typhus fever. "The conditions which indicate its use are great prostration of strength, fetid evacuations, and dry and furred tongue." In putrid dysenteric affections, secondary syphilis, scrofula, disorders of the liver, glandular enlargements, and in suppressed or deficient menstruation, it has afforded relief.

"As a local remedy, it is found useful in all affections attended with fetor, such as gangrenous, cancerous, scrofulous and syphilitic ulcers, ulceration of the gums, carbuncle, ozæna, mortification, putrid sore-throat, etc. In these cases it is applied as a gargle, wash, ingredient of poultices, or imbibed by lint." In scarlatina, attended with sloughing of the fauces, it has afforded great relief, used as a gargle, or injected into the throat.

It is employed as a disinfectant and antiseptic, with a view to its chemical action. It destroys the fetor and interrupts putrescency, when applied to gangrenous parts, as wounds, ulcers, etc., and aids in separating the dead from the living tissues, improves the secretions, and reduces the quantity, if excessive.

As a gargle it should be diluted with eight or ten parts of water; as an injection into the vagina, with fifteen to thirty parts of water; and as a lotion it should be diluted to suit the case, usually some five or six parts of water at first, and increased or diminished according to circumstances.

CALX CHLORINATA.

THERAPEUTIC ACTION. — Chlorinated Lime is antiseptic, disinfectant, desiccant, stimulant and astringent. It is applied to gangrenous parts, foul and fetid ulcers, burns, chilblains, compound fractures with offensive discharges, to the throat as a gargle in states of putrescency, ulcerated gums, fetid breath, etc., and to the uterus or vagina in fetid discharges, in epidemic dysentery both internally and by injection, in purulent ophthalmia; in short, it is used as an antiseptic in all cases of a septic tendency, as a desiccant in excessive purulent discharges, as a topical stimulant and astringent in fetid, indolent and sluggish ulcers, and as a disinfectant whenever the ulcer or its secretion is offensive or of an infectious character. It arrests animal putrefaction, and destroys pestilential and infectious miasms.

It is an important disinfectant for the dissecting room, bed-chambers of the sick laboring under some infectious and offensive disease, for privies, drains, sewers, ships, hospitals, prisons, stables, damp and offensive cellars, etc.

CREASOTUM.

Therapeutic Action.—Creasote possesses antiseptic, styptic, narcotic, sedative, anodyne, and irritant powers. It is a powerful styptic and topical stimulant, and is often employed as an astringent and stimulant in cases of indolent and putrid ulcers, caries of the bones, etc. As an antiseptic, it is said no substance now known equals it in preventing the decay of animal matter. It may be used to preserve bodies for dissection, and for curing meats instead of wood smoke. It is probably one of the best agents within our reach in cases of indolent, vitiated and fetid ulcers, ulcerated and putrescent states of the throat occurring in malignant scarlatina, angina maligna, variola, carious states of the bones, and in morbid vaginal secretions proceeding from chronic ulceration of those parts.

It is used in the form of an alcoholic or aqueous solution. A lotion may be prepared by dissolving from five to ten drops of creasote in half a pint. We have often used it much stronger—from five to ten drops being dissolved in one ounce of water. It is seldom or never used as an internal antiseptic.

ACIDUM PYROLIGNEUM.

Therapeutic Action.—Pyroligneous Acid is an important application to extensive suppurating surfaces, especially if fetid or gangrenous. In old, foul, vitiated, and offensive ulcers, it is an excellent dressing. It is antiseptic and stimulant—the former property being due to the presence of creasote.

Pyroligneous acid is an application of great value in putrid sore throat, employed as a gargle, or by means of a sponge or swab. In variola, when the throat becomes ulcerated, and perhaps gangrenous, and in malignant scarlatina and angina maligna, the throat is covered with sloughs, offensive and putrid ulcers, requiring the use of antiseptics as well as topical stimulants. In these cases this acid is unquestionably one of the best applications that can be made.

CARBO LIGNI.

Dose.—From ten grains to one drachm.

Therapeutic Action.—Powdered Charcoal is frequently used as an antiseptic, and absorbent to fetid gangrenous ulcers. It serves to absorb the ichorous or offensive secretion, correct the vitiated or unhealthy state of the ulcer, and arrest the progress of gangrene. It is an excellent application to phagedenic ulcers, and to ulcers after their indolent or fungous structures are destroyed, with a view to aid in the detachment of the dead from the living parts. It is valuable to promote sloughing in cases where caustic has been employed to form an eschar. It may act by absorbing the secretion, and thus preventing its deleterious action upon the solids, and the progress of the disease, or it may act by correcting the secretion, or the action of the vessels or structure involved in the putrescent action; or, lastly, it acts by excluding the air as well as absorbing the moisture.

It is often used as a *tooth-powder* for cleansing the teeth, and destroying offensive breath arising from either carious teeth or a disordered state of the stomach. Its absorbent and antiseptic powers are observed in its preservative action upon fresh meat, which, if embedded with it in a close vessel, may be kept perfectly sweet for months. It is also used to preserve water during long voyages.

Charcoal is applied to ulcers or gangrenous parts in the form of powder or poultice, which may be made by combining it with the pulverized bark of slippery elm, yeast, linseed-meal, or oatmeal.

It may be used as a disinfectant by sprinkling the powder in damp and offensive situations.

As an internal agent, charcoal is exhibited in acidity of the stomach, cardialgia, putrid eructations, fetid breath, constipation, diarrhœa and dysentery. Dr. Chapman asserts that in the latter disease, where the stools are highly acrid and offensive, charcoal entirely divests them of their bad smell and acrimony. Charcoal has been used in intermittents with advantage. We can but think its utility equivocal in this case.

SODII CHLORIDUM.

The well-known power of common Salt, in preserving meat from putrefaction, points to it as antiseptic, and hence it is used as a gargle in scarlatina maligna, and other putrid or gangrenous states of the throat. It is frequently used as a fomentation in sprains and bruises, and as a wash to offensive ulcers. It acts chemically, probably, and perhaps in part by its stimulant action upon the enfeebled and putrescent parts.

It must not be forgotten that the sick require salt in their food, and that in the moderate quantity in which it is usually employed it prevents sepsis.

DIVISION IX.

CLASS XVI.

EMMENAGOGUES.

Emmenagogues may be defined to be those agents which promote the menstrual secretion, either by a direct or indirect action upon the uterine organs. Many of the most respectable authorities doubt the existence of agents which act directly upon the uterus, and contend that the reputed emmenagogues act indirectly upon this organ. Many agents of this class act as general excitants to the whole system, and from this general excitation the menstrual secretion is often promoted. Again, a number of these agents act upon contiguous organs, and produce a determination to, and congestion of the pelvic viscera, and thus indirectly exert an influence over this secretion.

It would seem that the female organism possessed the power of elaborating the materials of nutrition in greater abundance than it required to supply its continued waste, and the redundant portion, it would seem, passes off in the menstrual secretion, except during the period of pregnancy and lactation, during which time the superabundant portion of nutritive matter goes to supply the materials for the reproduction and sustenance of a new being. The health and enjoyment of the female seems to be very intimately interwoven with the normal condition of this periodical secretion, from the period of puberty to the cessation of the discharge; its suppression or retention being almost invariably followed by disease of a more or less aggravated character.

Amenorrhea is that disease or state of the system which arises from a retention or suppression of the catamenia.

This abnormal condition may arise from very opposite conditions of the system; and, indeed, it occurs under such a contrariety of circumstances in respect to plethora or anemia, debility or tonicity, and requiring such dissimilar remedies to reproduce the secretion, that it is by no means strange that writers should question the existence of any direct emmenagogue agents. Under certain circumstances, one agent or class of agents will seem to promote the secretion while under other circumstances, and when a train of very different symptoms are present, a remedy entirely unlike or opposite the former one, will prove emmenagogue.

Action of Emmenagogues.—We think that all of the agents that prove emmenagogue act in one of the following ways: 1. They may act as sedatives, diminishing the force of the circulation, and the vascular irritation with determination to the uterus. 2. They may cause determination of blood to the pelvis, and produce that congestion of the uterus necessary to the production of the secretion. 3. They may increase the quantity and quality of the blood, when amenorrhea depends upon anemia. 4. They may act upon the uterus through the nervous system, stimulating it to increased activity.

1. In females of a plethoric habit, when suppression of the menses has resulted from cold or other causes, there is always determination of blood to the uterine organs, a state bordering on inflammation; and owing to the retention, there is vascular repletion, and consequently more or less excitement of the circulation. In this condition, such agents as allay the vascular excitement, equalize the circulation, and relax the system, prove emmenagogue. Thus the refrigerant hydragogue cathartics prove advantageous by causing a determination to the bowels, and by diminishing the vascular repletion. The warm pediluvia and the hip-bath prove advantageous by their relaxing effects upon the system. Nauseants are employed for the same purpose, and for their sedative influence. These different measures combined, generally prove effectual in restoring the menstrual secretion in this condition of the system; and they do it by diminishing that active determination to the uterus which has been the cause of the suppression.

2. In certain cases suppression or retention of the menses may be caused by a torpor of the uterus; it does not receive a sufficient supply of blood to furnish the secretion. In such cases, agents that cause a determination of blood to the pelvis, act as emmenagogues. Hence those drastic cathartics that act especially upon the lower part of the large intestine, as the black hellebore, aloes, gamboge, savin, etc., produce the necessary congestion.

3. When retention or suppression of the menses is dependent upon an anemic condition of the system, as is often the case, iron and the bitter tonics, by increasing the quantity and quality of the blood, until there is sufficient for the formation of the secretion, prove our most efficient emmenagogues.

4. When amenorrhea is dependent upon deficient innervation, all other conditions being present, then such agents as act as stimulants to the organ will reproduce the secretion. Of the measures employed in this way, probably none act as directly as *electricity*, the current being passed through the uterus; this has been known to reproduce the secretion in a very short time. The black cohosh, blue cohosh, guiacum, madder, savin, rue, borax. etc., probably act in this manner, as we have direct evidence that they do act in certain conditions as direct stimulants to the uterus.

CIMICIFUGA—MACROTYS.

THE ROOT OF THE C. RACEMOSA VEL MACROTYS RACEMOSA.—U. S.

Preparation.—Tincture of Macrotys (the fresh root).

Dose.—From the fraction of a drop to ten drops.

Specific Indications.—Sense of soreness, with dragging pains in uterus, and muscular pain in back, loins, hips and thighs. The pains resemble those of rheumatism.

Therapeutic Action.—Probably no remedy has a more direct action upon the reproductive organs of woman, than the Black Cohosh. Its influence is towards normal innervation, normal circulation, and normal functional activity. When suppression or tardy appearance of the menses depends upon an excited innervation, no remedy will be found better than the one under consideration.

We not only employ it in amenorrhœa, but in cases of tardy, slow, irregular, scanty, or protracted menstruation. The reader will notice the indications as above, and the influence of the remedy, and can adapt it to these cases.

Macrotys is an excellent remedy in the treatment of many cases of dysmenorrhœa, especially when there is the slightest evidence of a rheumatic diathesis. We usually combine it with Pulsatilla, and give it for a week preceding the expected period, and until the discharge is fully established. Sometimes it will have to be continued for three or four months before complete relief is obtained.

One of the principal uses of Macrotys is to relieve the uneasiness, aches and pains which attend pregnancy. In the enlargement of the uterus during gestation, there are many causes of deranged innervation. It is absurd to say to the suffering woman, " this is incident to your condition, and will cease with the birth of the child." Macrotys will relieve the majority of these pains, and at the same time will prepare the way for an easier labor and a better getting up. It is a true *partus preparator*, and will be found to relieve a great deal of suffering.

It can not be regarded as a parturient, yet when the patient suffers from " false pains," or shows evidence of a rheumatic condition of the uterus, it will give relief and facilitate labor.

Macrotys is *the* remedy for rheumatism of the uterus. Not for all cases, but for so large a number, that it is suggested whenever we find rheumatic pain in this region.

As an anti-rheumatic, Macrotys is indicated by muscular pains, or by pain seemingly increased by muscular contraction.

PULSATILLA.

THE PLANT OF PULSATILLA NIGRICANS.—EUROPE.

PREPARATION.—Tincture of Pulsatilla (fresh plant).

DOSE.—Of gtt. v. to gtt. xxx. to water ℥iv., a teaspoonful every three or four hours.

SPECIFIC INDICATIONS.—The patient is nervous, restless, uneasy, and despondent; looks upon the dark side of life, and gives way to the emotions; has excitement with feebleness of the reproductive function.

THERAPEUTIC ACTION.—Pulsatilla exerts a direct influence upon the nervous system, relieving irritation and strengthening the circulation in the nerve centers. It has a direct influence upon the reproductive organs of both sexes, relieving irritation and strengthening functional activity.

It is a prominent remedy for the relief of "nervousness" and the minor symptoms of hysteria, especially when due to excess or abuse of the reproductive apparatus. We might include cases of want of gratification of the sexual appetite, unsatisfied desires.

Its influence upon the ovaries and uterus is so direct, relieving irritation and giving better innervation, that it becomes one of our most certain emmenogogues. The reader will be able to select the appropriate cases by following the indications given.

It is also a valuable remedy in dysmenorrhœa, associated with Macrotys, and given for a week before the expected period.

At the meno-pause it will relieve many of the nervous symptoms, especially where blood-making and nutrition are enfeebled.

GOSSYPIUM.

THE INNER BARK OF THE ROOT OF GOSSYPIUM HERBACEUM.—U. S.

PREPARATION.—Tincture of Gossypium (the fresh root before the bolls are ripe).

DOSE.—From five drops to half a drachm.

THERAPEUTIC ACTION.—Tincture of Cotton Root is one of the most powerful emmenagogues in the materia medica. It is a direct stimulant to the ovaries and uterus, causing an increased flow of blood, and increased innervation. If there is irritation of these organs, this remedy must not be used. If there is an atonic condition, with symptoms of the flow coming on, it is a good remedy. At times a woman will feel no evidence of the coming flow, but instead, dullness and oppression, and here also the remedy may be given.

In some cases Gossypium will prove abortive, and care should be taken not to administer it where there is a suspicion that the arrest is due to pregnancy.

Gossypium exerts a stimulant influence upon the entire urinary apparatus, and increases the flow of urine. For this purpose it may be used when there is an atonic condition of the pelvic viscera.

The reason why there has been so many failures to obtain a medicinal action from the Gossypium, is because the root was dug after the cotton was picked, or had been kept in store until its properties had been lost by age.

SABINA.

THE TOPS OF JUNIPERUS SABINA.—ASIA.

Dose.—From five to fifteen grains.

Therapeutic Action.—Savin is emmenagogue, abortive, stimulant, diuretic, diaphoretic, anthelmintic, rubefacient and vesicant.

It is a very powerful agent, and may be regarded as an acrid poison, for such it proves to be when given internally, or applied topically, to either animals or man. These properties arise from the presence of a large amount of volatile oil which the leaves and boughs furnish by distillation. In large doses it occasions vomiting and purging, and gastro-enteric inflammation.

It acts as a powerful uterine stimulant, and as such it may be used whenever there is a torpid or inactive state of the uterine vessels. Its highly excitant powers forbid its exhibibition in cases of sudden suppression of the uterine secretion, arising from cold or some mental emotion, or from an attack of some acute disease; nor is it admissible in amenorrhœa occurring in plethoric habits, over-excited organic action, or in uterine or pelvic inflammation.

JUNIPERUS VIRGINIANA.

THE LEAVES.

Dose.—Powder, ℈j. to ʒss. Oil, gtt. v. to xv.

Therapeutic Action.—The leaves of the Red Cedar are emmenagogue, stimulant, diuretic and diaphoretic.

They are quite similar to the Savin in appearance, and also in their medical virtues. They are much less energetic in their general excitant effects upon the system. They are often sold for the *true Savin*, and the close similarity between the leaves of the two species renders it exceedingly difficult to detect the fraud. They are exhibited in amenorrhœa attended with deficient action of the uterine vessels, and a languid or atonic state of the general system. Like the Juniperus Sabina, it promotes the perspiratory and renal secretions, and acts as a general excitant. It has been used with advantage, it is asserted, in chronic rheumatism and dropsical diseases.

LEONURUS.

THE PLANT OF LEONURUS CARDIACA.

DOSE.—Infusion, a wineglassful or more. Tincture, from ʒj. to ℥ss. Extract, grs. v. to xv.

THERAPEUTIC ACTION.—Motherwort is emmenagogue, nervine, antispasmodic, tonic, diaphoretic and laxative.

This simple and very common agent, with which almost every person is familiar, has not received that meed of praise to which it is justly entitled. Its tonic properties adapt it to relaxed and debilitated states of the system. Its antispasmodic and nervine powers render it an appropriate and valuable agent in hysteria, chorea, convulsions, and other derangements of the nervous system, associated with the uterine irregularity or obstruction. In these cases a warm infusion may be taken freely on going to bed, the feet being placed in warm water, for three or four days prior to the expected menstrual flux. If the case is chronic, attended with evidences of a nervous derangement, the warm infusion may be taken at night, and a cold infusion, the tincture, or the extract, may be used during the day.

POLYGONUM.

THE PLANT OF POLYGONUM PUNCTATUM.—U. S.

DOSE.—Tincture, ʒj. to ʒiv. Infusion, ℥ij. to ℥iv. Extract, grs. iv. to x.

THERAPEUTIC ACTION.—The Polygonum is emmenagogue, diaphoretic, diuretic, stimulant, antiseptic, rubefacient and discutient.

We have used it frequently in uterine obstructions with apparent advantage, but in other instances without deriving any benefit from its administration.

We have found it a valuable stimulating diaphoretic in sudden colds, febrile and inflammatory diseases, given in the form of a warm infusion to the extent of producing diaphoresis. The infusion has been found useful in coughs, colds, catarrhal and pectoral affections, and likewise in calculous or nephritic irritation of the genito-urinary organs.

SENECIO.

THE ROOT AND HERB OF SENECIO GRACILIS.—U. S.

PREPARATION.—Tincture of Senecio.

DOSE.—From five drops to half a drachm.

THERAPEUTIC ACTION.—The Senecio is emmenagogue, diaphoretic, diuretic, expectorant, alterative and tonic. It appears to exert a specific influence upon the uterine organs, and may with propriety be termed a uterine tonic. It is for this purpose that it has been so much used for the last few years, and for which it has gained such repute. By many it is considered superior to any other article now in common use in amenorrhœa, dysmenorrhœa, menorrhagia, and many diseases depending upon uterine derangements.

ACHILLEA.

THE PLANT OF ACHILLEA MILLEFOLIUM.

PREPARATION.—Tincture of Achillea.

DOSE.—From two drops to half a drachm.

THERAPEUTIC ACTION.—This agent is emmenagogue, tonic, astringent and alterative. It has been employed in intermittent fever as an antiperiodic, its active principle having been proposed as a substitute for quinine. It has been used with reported success in hemoptysis, hematuria and incontinence of urine; and also in flatulent colic and nervous affections.

It has been principally used, however, in uterine disease, in which it has been found very efficient. Dr. Ronzier Joly states that it has decided power in promoting the uterine functions; he reports two severe cases, one of amenorrhea, in which there was sore throat that resisted ordinary treatment; this agent was administered, the menses returned in abundance, and the patient quickly recovered: in the other, there was suppression of the lochia, with severe fever and delirium; other agents having failed, this was resorted to, and the lochia re-appeared the next morning.

RUTA.

THE HERB OF RUTA GRAVEOLENS.—U. S.

DOSE.—In substance, ℈j to ʒss, two or three times a day, mixed in a little simple syrup; of the oil, gtt. ij. to vj. mixed with sugar and water; of an infusion, ℥j. digested in Oj. of water, ℥j. to ℥ij.

THERAPEUTIC ACTION.—Rue is emmenagogue, stimulant, antispasmodic, anthelmintic, narcotic, abortive, deobstruent and tonic. It is an energetic excitant, acting upon the secretions generally, more especially when deficient from a debilitated state of the organs. Rue is a popular remedy in amenorrhœa, especially in those cases connected with hysteria or epilepsy. Its excitant powers seem to be directed to the uterus with peculiar force, whose secretory functions, if scanty or arrested from an atonic state of the uterine vessels, it seems to augment; it is also useful in chlorosis. Its active properties are dependent upon a volatile oil, furnished by the leaves. This oil, and even the roots, leaves, and expressed juice, have been frequently employed to cause abortion; hence it has been regarded as an abortive.

ROSMARINUS.

THE TOPS OF ROSMARINUS OFFICINALIS.

DOSE.—From two to five or ten drops.

THERAPEUTIC ACTION.—Rosemary is stimulant and carminative, like most other labiate plants It was formerly esteemed an emmenagogue, and was used, it is asserted, with advantage in uterine obstructions, chlorosis, hysteria and other nervous diseases attended with derangement of the uterine secretion.

Oil of Rosemary is a pungent stimulant and rubefacient. It is mostly combined with liniments and perfumes. It is united with other articles and used in alopecia, or baldness, and also as a liniment, or embrocation to painful parts.

RUBIA TINCTORUM.

THE ROOT.

DOSE.—ʒss. to ʒij., three or four times a day.

THERAPEUTIC ACTION.—Madder is emmenagogue, diuretic, tonic and astringent.

The opinions entertained by physicians of the medical virtues of this agent are extremely discordant. While some regard it as a powerful emmenagogue, others think it devoid of this quality, or even of any other prominent one.

ASARUM.

THE ROOT OF ASARUM CANADENSE.—U. S.

PREPARATION.—Tincture of Asarum.

DOSE.—From ten drops to half a drachm.

THERAPEUTIC ACTION.—The Asarum is emmenagogue, stimulant, carminative, tonic, diaphoretic, pectoral and errhine. It is but little used for medicinal purposes, and from frequent exhibition of it we are inclined to think its therapeutic virtues are not perfectly understood.

As a stimulating diaphoretic and tonic it is analogous to the aristolochia serpentaria, and may be used under similar circumstances as a substitute for that article.

HEDEOMA PULEGIOIDES.

DOSE.—It is usually administered in the form of infusion, which may be taken freely.

THERAPEUTIC ACTION.—Pennyroyal is emmenagogue, diaphoretic, stimulant and carminative. It is a very popular domestic remedy, and is often used with decided advantage to produce diaphoresis and promote the catamenial secretion. In those cases of amenorrhea in which it is evident that uterine torpor exists, caused by sudden exposure to cold, or by getting the feet wet, the free use of a strong infusion of pennyroyal just before going to bed, the feet being previously bathed in warm water to which mustard or salt has been added, will often prove an efficient remedy. It is also employed in the chronic forms of the disease, it being taken freely for several days prior to the proper period of menstruation.

To reproduce the lochial discharge, after it has been suppressed, we know of no better agent; in these cases we invariably resort to the infusion of pennyroyal, directing it to be taken freely.

CAULOPHYLLUM.

The Caulophyllum or Blue Cohosh, possesses similar properties to the macrotys. It is, however, considered by many to be superior as an emmenagogue, and we ourselves prefer it for that purpose. We have used it in many cases, and almost always with good effects. We employ it, however, always in warm infusion, never having been able to obtain its full influence from any other preparation.

ALOE.

Aloes deserve a passing notice under this head, notwithstanding its properties have been fully described under the class of cathartics. It is supposed to act as an emmenagogue, by causing an afflux of blood to the pelvic viscera, in consequence of its stimulant action on the lower part of the intestinal canal. In amenorrhea occurring in persons of a lymphatic temperament, or where it is evident there is torpor of the uterine organs, and a want of the necessary determination of blood, it is sometimes a valuable remedy.

ACTÆA.

THE ROOT OF ACTÆA ALBA.

PREPARATION.—Tincture of Actæa.

DOSE—From one drop, to half a drachm.

THERAPEUTIC ACTION.—The Actæa alba is alterative, narcotic, emmenagogue and said to be parturient.

Its medical properties are quite similar to those of the Cimicifuga, for which it is often used as a substitute. This agent may be resorted to in all cases in which the cimicifuga is indicated, provided that article is not at command.

It is valuable in uterine derangements, as amenorrhea, dysmenorrhea, and irregularities in the uterine functions, also in chorea, hysteria, epilepsy and convulsions connected with catamenial derangements. It is very beneficial in leucorrhea and prolapsus uteri, and may be taken internally in the form of a decoction, tincture or syrup, and at the same time used as an injection.

TANACETUM.

The Tansy is frequently employed in domestic practice as an emmenagogue, especially in cases where the suppression is the result of cold. The warm infusion is taken freely upon going to bed, the feet being well bathed in warm water.

MONARDA.

The Horsemint, as well as the other mints, is sometimes resorted to in domestic practice, to reproduce the menstrual discharge when it has been suppressed from cold. The warm infusion is taken freely, the patient having her feet bathed, and using other adjuvant measures.

MYRRHA.

Gum Myrrh, the general properties of which are described elsewhere, is emmenagogue, and as such is well adapted to torpid and atonic states of the uterine system connected with general debility.

HELLEBORUS NIGER.

Black Hellebore, already described under cathartics, is also possessed of emmenagogue power. Some have supposed it acted directly or specifically upon the uterus, while others refer its effect upon that organ to its drastic and exciting action upon the bowels. Dr. Mead, who first announced its emmenagogue properties to the profession, regarded it superior to any other agent of this class. It is considered adapted to torpid, phlegmatic individuals, with a languid state of the pelvic circulation.

CANTHARIS.

Cantharis is emmenagogue, stimulant, diuretic, etc. Spanish Flies have long been favorably noticed in the treatment of amenorrhea by different writers, and from their well-known specific action on the urinary organs, we may readily infer they are capable of doing much good in catamenial obstructions.

CHALYBEATES.

Ferri Sulphas.—Astringent, tonic and emmenagogue. Sulphate of iron is one of the ferruginous preparations which has gained a reputation as an emmenagogue. It is resorted to in amenorrhea, attended with a relaxed and languid state of the general system, and torpid or deficient action on the part of the uterine organs.

Ferri Carbonas Præcipitatus.—The precipitated Carbonate of Iron is regarded as an emmenagogue. It is recommended in amenorrhea, chlorosis, neuroses, anemia, etc. In amenorrhea, it is often associated with Gum Myrrh and Gum Guaiacum.

ELECTRICITAS.

Electricity, whether the Common or Friction Electricity, the Voltaic or Galvanic Electricity, or the Magnetic Electricity, acts as a very powerful excitant upon the whole system or upon the parts through which it is made to pass. It varies in its effects according to the mode of applying it; moreover, the general physiological influence arising from its application is to stimulate or arouse the sensor and motor nerves, and to promote secretion and absorption.

In amenorrhea, attended with diminished nervous energy and vascular activity in the pelvic region, electricity, applied by faradization, the current being passed through the region of the uterus, often acts promptly in restoring or promoting the secretory functions of that organ. The current or shocks should be made to pass in a direction corresponding with the general course of the nerves, or in this case, from the sacrum to the pubes, the pelvis being made to form a part of the circuit. In some instances the conducting wire is passed through a glass tube to the uterus, and thus the electric current is made to act directly upon that organ.

OTHER EMMENAGOGUE MEASURES.

Though we have described the principal agents relied upon as emmenagogues, yet there are certain conditions of the system, existing in connection with amenorrhœa in some cases, that demand other remedies. Thus, in acute suppression of the menses, with febrile re-action, we have found the direct sedatives, as the tinctures of Veratrum viride and Aconite, act very efficiently as emmenagogues. Again, in cases where there is pain and heat in the pelvic region and back, pain in the limbs, headache, dizziness, suffusion of the face, etc., indicating congestion of the pelvic viscera, a mild hydragogue cathartic, as the compound powder of Jalap and Senna, with cream of tartar, sometimes acts efficiently.

As adjuvant measures, we frequently employ hot fomentations of bitter herbs to the lower part of the bowels and genital organs, or direct the patient to sit over the vapor of a decoction of Tansy, Pennyroyal, Hops, etc. In other cases, where there is torpor of the uterine organs, and a want of proper determination of blood to them, sinapisms applied to the inside of the thighs and to the breasts frequently answer a good purpose, or we use stimulating vaginal injections, as Aqua Ammonia, ʒj; Milk, Oj; etc.

CLASS XVII.

PARTURIENTS.

A PARTURIENT may be defined to be an agent which acts upon the uterus, increasing its contractile powers, arousing it to renewed action when the pains and propulsive efforts have subsided, or when they still continue their regular occurrence, but have become insufficient for the accomplishment of the labor.

"Various specific remedies," says Dr. Ramsbotham, "have been recommended at different times, to increase the parturient throes, and facilitate the child's birth; but I believe that the whole of these substances, one only excepted, act upon the womb through the excitement induced in the arterial system. They first stimulate the nervous, then the arterial systems, and through the medium of these the uterus. Almost the only medicine now used as a uterine excitant, is the *ergot of rye;* and I have no hesitation in declaring my opinion that its action is specific, and that the uterus is not affected through any disturbance first set up in the arterial system."

This opinion of Dr. Ramsbotham is supported by the best authorities of the present day, though some add to the list of specific agents *borax, rue, Indian hemp, gossypium herbaceum,* and the *black and blue cohosh.* From our investigation of the parturient powers of these remedies, we should be inclined to believe that if they have any such action, it is at best but feeble, and probably *indirect.* It is generally admitted that any arterial stimulant, especially if given in a fluid form, so as to act as a diluent, will in some cases increase the contraction of the uterus. In this case they act *indirectly,* by causing an excitement of the entire [illegible] in which the uterus sympathizes. We have n[illegible] even warm diluents will sometimes increase [illegible] this organ. For instance, the *warm ginger tea* so frequently recommended and even forced on patients by nurses; though in some cases we have thought they retarded the labor. The Indian hemp was tried in a few cases by Dr. Simpson, and of its action he says: "In the few cases of labor in which it was tried, parturient action seemed to be very markedly and directly increased after the exhibition of the hemp; but far more extensive and careful experiments would be required before a definite opinion could be arrived at relative to its possession of oxytoxic powers, and the amount of these powers." Borax has had considerable repute as a parturient, especially in Germany; but authors of the present day generally coincide in the opinion that if it does possess any such power it is very weak. The parturient powers of the gossypium rest entirely upon hearsay evidence; it is reported to be used by negresses in the South for this purpose, and for procuring abortion; but as yet we have seen no such effects from its use in our practice, and we have yet to learn of a case in which they were well substantiated. The two species of cohosh named, have long been considered as possessing this property; but we feel inclined to doubt it, notwithstanding the favorable reports in regard to their use.

"Every one," says Dr. Dunglison, "who has practiced extensively in obstetrics, must have observed that the parturient efforts occasionally flag, and, indeed, are wholly suspended; yet they recur, and the labor proceeds rapidly to a favorable termination; and if in any such case a remedy presumed to be a parturient, were administered during the period of the cessation of pain, the recurrence of the pain in this sudden manner, could hardly fail to be ascribed to the administration of the presumed parturient. Let the obstetrical practitioner, who has never had recourse to any such agent, call to mind how few the cases are in which delivery has had to be aided, in consequence of the *total* cessation of the pains, and how common it is to meet with a partial or temporary cessation, and he will see that the absolute necessity for the use of a parturient is not a common occurrence."

We may, then, justly divide parturients into two classes, the *direct* and *indirect;* the first consisting of one, possibly of two or three agents; the second consisting of several remedies, and other measures which exert an influence over the gravid uterus through their general effects upon the system.

Ergot being the type of the *direct* parturients, if not the only one, our next inquiry is as to its mode of action. Here we find a difference in the opinion of authorities; for while some consider it as a special stimulant, others class it with sedatives. "Ergot of rye," says Headland, "is a stimulant to the muscular nerves of the uterus in the female, but to no other nerves in any marked degree. Borax and rue possess a similar action, but are not so efficient. When given in an over-dose, ergot has a dangerous action on the brain, producing at some times narcotism, at others syncope."

Direct parturients may be administered with advantage, when there is inefficient uterine action,—the pains being weak, the intervals between them distant, the space of time during which they continue short,—and if the labor has already continued for a considerable length of time; providing there is no disproportion between the pelvic cavity and head of the child, the os uteri is fully dilated, or very dilatable, and there is no rigidity of the soft parts. In speaking of ergot, Dr. Ramsbotham says: "It must not be given in any case where the lingering labor depends upon a mal-position of the head. It may be admissible occasionally in breach presentations, but in no case of transverse-position of the fetus, provided the term of gestation is nearly completed, should we ever contemplate administering ergot. It must only be given in cases where the sole cause of delay is a torpid or feeble state of the uterine action, or where it is desirable to terminate the labor speedily—and that too by means of the natural powers—in consequence of hemorrhage." This agent is also recommended in hemorrhage following parturition, from inversion of the womb, from the retention of the placenta, or a portion of it, or firm clots of blood; and also in intra-uterine polypi, in order to excite a forcible contraction of this viscus, and the expulsion of its contents.

Of the *indirect* parturients we may notice the influence of *stimulants*, of *warm diluents*, of *friction*, and *change of posture or exercise*. Stimulants, as already stated, prove parturient by the general excitement which they produce; they are indicated when there is much prostration, when the pulse is slow and feeble, the uterine contractions powerless; while, at the same time, there is but little loss of blood.

Warm diluent drinks are the simplest agents that can be used, and are frequently apparently successful: if the stomach does not reject them, and they are grateful to the patient, they may always be allowed. Friction over the uterine globe is frequently successful in increasing the frequency, length, and intensity of the pains, and may be resorted to for this purpose. Change of posture, or exercise in the room, when not contra-indicated, is a very efficient means of stimulating the contractions of the uterus. It also gives relief to the patient to change her position, sit up, or walk in the room, as her own inclination dictates.

ERGOTA—SECALE CORNUTUM.

THE FUNGOUS GROWTH ON RYE.

PREPARATIONS.—Powder. Infusion. Tincture of Ergot.

DOSE.—Of the powder, grs. x. to grs. xv. every fifteen to thirty minutes; of an infusion, ℥j.; of the tincture, gtts. v. to ℥j·

THERAPEUTIC ACTION.—Ergot is a prompt and very efficient parturient, and as such is more frequently exhibited than any other article of the materia medica. Indeed it is believed by many to be the only article now known capable of exerting a specific action upon the uterus, causing its fibers to contract and its contents to be expelled.

In small doses it exerts no obvious effect upon the male, and upon the uterus of the unimpregnated female it has also been said by some to exert no perceptible influence; and even in a state of pregnancy others have asserted that it does not act usually upon that organ unless it is in a parturient state—unless labor has absolutely commenced. Its action upon the unimpregnated uterus is clearly manifested by the bearing-down pains or uterine contractions which it causes, and by its capacity to check uterine hemorrhage, expel hydatids, polypi, etc., and even to induce metritis, and the frequent abortions which it has caused may be cited as proofs of its action upon that organ before gestation is completed.

In over-doses ergot is an acro-narcotic poison. Nausea, vomiting, vertigo, dimness of sight, loss of sensibility, coldness, and insensibility of the extremities, convulsions, and other disordered states of the nervous system; typhoid and epidemic diseases, with abscesses and gangrenous ergotism of various parts, which become black, dry, and shrunk, attended with loss of the toes, etc., etc., are evidences of its deleterious effects upon the system. When taken for a long time in large quantities mingled with the food—circumstances which have occurred in many of the European States, as France, Prussia, Bohemia, Saxony, Denmark, Switzerland, etc.—the effects stated which were satisfactorily traced to this cause, can not fail to establish its character as a poison.

The most important therapeutic application of the ergot is that of a parturient. When the contractile energies of the uterus are feeble or insufficient to secure the delivery of the fœtus the ergot is an appropriate agent. Labor not unfrequently commences and continues for a long time, but owing to the feeble contractile action of the uterus, it does not advance, and the strength of the patient may become exhausted; or the pains may be strong and the contractile energies of the uterus may be such as to advance the labor during its early stages, but its powers may become expended, or it may pass into a state of inertia; or one set of uterine fibers may act pretty efficiently while the other set is inactive (a circumstance which we have witnessed in several instances), or the strength of the patient may be exhausted. In either condition the ergot will be found exceedingly important in arousing the uterus to increased action.

Prior to the administration of the ergot in all cases, it becomes the imperative duty of the accoucheur to ascertain, first, that there is a proper presentation of the fœtus; second, that there is a proper conformation of the pelvis and soft parts; and third, that the os uteri is dilated or easily dilatable, and the soft parts relaxed and lubricated with the proper secretion.

It is evident a deformity of the pelvis, a contracted pelvis and large head, rigidity of the os uteri and soft parts, a presentation that would offer a mechanical impediment to the delivery, are circumstances which contraindicate its exhibition; nor should it be given early or before the head has descended into the pelvis.

Ergot is indicated when the life of the patient is endangered by extreme exhaustion from the long continuance of labor, or by hemorrhage occurring during labor, after the rupture of the membranes, provided the placenta is not situated over the os uteri, and also in cases of death of the fœtus, when the speedy completion of the labor is required in order to save the life of the patient.

It is indicated when the placenta is retained from want of uterine contraction. In cases of hemorrhage, however, the manual extraction of the placenta should take the precedence, as the death of the patient might ensue before the action of that agent would cause contraction and its expulsion. The introduction of the hand generally excites uterine contractions.

In anticipated hemorrhages (for there are some females subject to flooding at every confinement), its use is indicated fifteen or twenty minutes before labor is expected to be completed, in order to insure the immediate expulsion of the placenta and the early tonic contraction of the uterus. We omitted to state in its proper place that in *nates and foot presentations* it may be necessary to use it, to prevent the child from becoming asphyxiated—a circumstance which may occur from the compression of the cord between the head and the bones of the pelvis, if the head is long retained in this position.

The accumulation of clots or coagula in the womb, the formation of hydatids or the presence of polypi, indicate the use of the ergot. In uterine polypus, it has been employed to secure the descent of the tumor into the vagina, in order to render it accessible to mechanical extirpation.

Ergot is employed to restrain uterine hemorrhage, whether puerperal or non-puerperal. It causes a contraction of the muscular fibers of this viscus and thereby compresses and empties the vessels and closes their orifices. It is also found to restrain excessive lochial and catamenial discharges, showing that a state of pregnancy is not, as has been asserted by some, an indispensable condition to insure its specific action upon the uterus.

In cases of abortion or threatened abortion, attended with hemorrhage, or in cases where abortion is desirable from a deformity of the pelvis, the pelvis being so contracted as not to admit the passage of a full-grown fœtus, the ergot has been employed.

Its utility in arresting hemorrhages from other organs has been asserted, but it is difficult to explain its therapeutic action in these cases, and indeed many writers think its capacity to arrest hemorrhages from the nose, gums, lungs, stomach, bowels, etc., as has been asserted by some, is more than doubtful. It can not be denied, however, that many respectable medical men repose confidence in its utility in these cases. Notwithstanding the Ergot is justly entitled to a high meed of praise for its true value as a parturient, yet the fact that it is capable of doing serious injury to both mother and child, if injudiciously employed, should not be disguised. That it has often destroyed the child does not, we think, admit of a reasonadle doubt. When given as a parturient, its action upon the uterus is generally perceptible and unmistakable in from ten to twenty minutes, in the violence and unceasing character of the pains: they are constant, unremitting, or if they do remit, the remission is but momentary—they do not usually cease until the expulsion of the child, and in many instances they continue for some minutes after, and thus secure the speedy removal of the placenta and also the contraction of the uterus into a globular form. If there should be a distortion of the pelvis capable of producing a mechanical impediment to the advancement of the fœtus, it is evident this unceasing, forcing, contractile effort on the part of the uterus to get rid of its contents, might assume such violence as to cause its rupture or the death of the child. When the uterus is fully under its influence, that alternate contraction and relaxation observed in the natural process of labor, is no longer witnessed—a permanent rigidity of the soft parts is maintained, and unless they are soft and flexible—in other words, in a state of proper relaxation before the ergot is administered—it is evident a laceration of them may ensue, and in this way also endanger the life of the mother.

USTILAGO MAYDIS.

THE FUNGUS GROWING ON ZEA MAYS.

Preparation.—Tincture of Ustilago Maydis.

Dose.—From the fraction of a drop, to ʒj.

Therapeutic Action.—This fungus (corn smut) has a very similar action to ergot of rye though its parturient action is not nearly so strong. Given in moderate doses, say ʒss, it is thought to increase the force of uterine contractions.

It is employed to stimulate spinal and sympathetic innervation, and to give strength to the capillary and venous circulation. It may be given in hemorrhage from the uterus, bowels, or lungs. In impairment of the cerebral circulation with dizziness, inability to command the voluntary muscles, or the activities of the brain, this remedy will sometimes serve a better purpose than Ergot or Belladonna.

In diseases of women, it may be thought of when the person has a pendulous abdomen, full and relaxed perineum, and increase in size of the uterus with atony.

CAULOPHYLLUM.

Preparation.—Infusion. Tincture of Caulophyllum.

Dose.—Of an infusion, ℥ss. to ℥j.; of the tincture, gtts. v. to ʒj.

Therapeutic Action.—Caulophyllum is described as being parturient, emmenagogue, antispasmodic, diaphoretic, diuretic and alterative. It possesses some reputation as a parturient; many considering it the equal of ergot. Its action, however, is stated to be essentially different, for while the ergot produces continuous spasmodic contractions, this agent merely stimulates the normal uterine action. As a parturient the warm infusion is administered freely. It is a very good emmenagogue, applicable in almost all conditions of the system.

Many who have used it attest to its merits in hysteria and other nervous affections. It appears to impart a vigorous and healthful energy to the nervous system. The Indians of our country employ it with great advantage as an antispasmodic and emmenagogue. It has been found useful in chorea, epilepsy, tremors, spasms of the stomach or bowels, and also as a remedy preparatory to parturition. It is said to be extensively used among the Indians to faciliate parturition. We have used it often, and known of its being used frequently by others, for a few weeks prior to confinement, as a preparatory measure to the important changes which take place at that time, with great apparent advantage. In many instances, when the females had been invariably the subjects of tedious and difficult labors, by the use of it for two or three weeks before confinement, all the anticipated difficulty vanished, the labors were rapid and easy, and the recovery speedy when compared with previous confinements. Although it may be somewhat difficult to assign a satisfactory reason as to the effects stated, or in other words its therapeutic action may be difficult of explanation, yet the effects have been so apparent, that any one knowing the character of different labors, would be forced to ascribe the different results to the use of this remedy.

We have employed it to a considerable extent in the treatment of chronic uterine disease, metritis, ovaritis, inflammation of the cervix uteri, leucorrhœa, etc. It tends to subdue chronic inflammation, lessens irritability, and gives tone to the uterine organs. We have also employed it with advantage in chronic nephritis, albuminuria, cystitis and urethritis.

There are various other articles said to exert more or less influence over the parturient uterus, augmenting its contractile and propulsive powers when they are feeble, or not sufficient to advance the labor and secure the early expulsion of the fetus. Among these agents may be named the

Macrotys Racemosa, or Black Cohosh. This article has been elsewhere fully described, and its parturient powers remain to be noticed. It has been employed by many as a substitute for the ergot, it being supposed to act upon the parturient uterus, and augment its contractile energies.

Actea Alba, is also reputed a parturient. Mode of exhibition the same as that of the Macrotys.

Asarum Canadense, is likewise said to increase the parturient efforts of the torpid uterus.

Many other articles, as ginger, black pepper, capsicum, tansy, etc., are in common use in domestic practice, as parturients. They are thought to excite the uterus and facilitate labor; and in many instances, to gratify the caprice of the patient, or that of her friends, we have given some of these agents, and with apparent benefit. It would seem, indeed, that almost any warm or excitant infusion, will occasionally prove beneficial; not, as we apprehend, by any specific action which they may exert upon the uterus, as is the case with the ergot, but by newly exciting or impressing the nervous system, and perhaps by increasing vascular excitement and arousing the organism to renewed action.

Another measure of great merit consists in the constant application and very frequent repetition of hot cloths—cloths wrung out of hot water and applied every five minutes over the hypogastric region — the hotter the application the better. Hot spirits might be applied in the same way. This application rarely fails to increase the force and activity of the pains, and will in most instances answer as a substitute for the ergot.

We know not but cold applications might answer the same or a similar purpose. We have never tested their efficacy. We have applied cloths wet with cold water or spirits of vinegar, over the hypogastric region, immediately after the birth of the child, to secure the speedy expulsion of the secundines and arrest hemorrhage, and have found them to cause an immediate contraction of the uterus in every case, even after grasping and frictions had failed. We recollect having applied cold camphorated spirts, or cold whisky over the uterine region, in a few cases of parturition, in which the pains were very feeble, or else the uterus had fallen into a state of inertia. These applications seemed to arouse and restore the lost powers of that organ, and do much in facilitating the labor. From this we infer the impression of the cold liquid upon the nerves distributed to the uterus and surrounding parts, induces a vigorous reaction in those parts, and thus the uterus is aroused, and its propulsive powers re-established. or greatly augmented.

CLASS XVIII.

ABORTIVES.

Abortives are those agents which are capable of producing an abortion or miscarriage in pregnant women. They are supposed to exert a specific influence over the gravid uterus, and to be capable of inducing uterine contractions, and effecting the expulsion of the fetus. We think that this class of reputed agents might with much propriety be stricken from the materia medica. That certain agents are capable of producing abortion, and do, under particular circumstances, have that effect is not denied, but that they produce it by virtue of any specific influence exerted upon the uterus under the ordinary circumstances of their administration, is very questionable.

Those agents which do produce abortion, act as very powerful stimulants or irritants. By the violence of their action upon the system, and especially upon the pelvic viscera, they incidentally excite the uterus to contraction, and cause the expulsion of its contents. Emetics, drastic cathartics, active stimulants or excitants, vesicants, stimulating diuretics, etc., not unfrequently induce abortion in this manner. Lifting, riding, leaping, over-exertion, excessive venery, sudden fright, or any strong mental emotion, excessive use of stimulants or condiments, scanty and innutritious diet, may each in its turn, and under certain circumstances, produce the same result.

Ergot is said to be an abortive by some, while others deny it, and say that it acts only upon the uterus during the process of parturition. It is claimed by others that this agent acts upon the uterus at any time, whether in its gravid or non-gravid state. The [illegible]tion of this agent, however, has been already fully co[illegible]

There are other articles spoken of as abortives, but for the reasons above given, and as these articles are all referred to, and their properties given in the description of other classes, we think it enough merely to name them in the present instance. The reputed abortives are, the savin and its oil, oil of tansy, rue and its oil, actea alba, gossypium, asarum canadensis, black hellebore, etc.

No agent of this class can be administered with any prospect of safety, for the production of abortion; their action in almost every instance produces severe uterine inflammation, or such a loss of power that uterine hemorrhage is the result.

NYSSA MULTIFLORA.

PREPARATION.—Tincture of the recent bark.

DOSE.—One teaspoonful every half hour to two hours.

THERAPEUTIC ACTION.— Dr. J. W. Pruitt writes: "My knowledge of it is from reports of those who have used it. Many years ago a very intelligent country old lady informed me of its antiabortive effect. It was given in decoction freely. My friend Dr. Thompson, of this place, informs me that he has had very satisfactory results from it in several cases of threatened abortion, giving it in infusion, in tablespoonful doses every few minutes; the doctor informs me it is very efficacious in false and inefficient pains. He obtained his knowledge from a colored woman, ninety years old, who had lived all her life among the Cherokee Indians."

VIBURNUM.

THE BARK OF THE ROOT OF VIBURNUM PRUNIFOLIUM.

PREPARATION.—Tincture of Viburnun.

DOSE.—From the fraction of a drop, to ten drops.

THERAPEUTIC ACTION.—Viburnum exerts a direct influence upon the uterus, quieting irritation and stopping contractions of its muscular fiber. It is the most certain remedy to prevent or arrest the progress of abortion, that we have, and in any case when it can be stopped, this remedy may be relied on. I have used it for many years, and place so much confidence in it that I always carry it in my pocket case for this purpose.

It will be found a good remedy in case of habitual abortion, given in small doses up to the fourth or fifth month, or if not given constantly, it should be administered for a week at the period when the monthly flow would recur.

It is a valuable remedy in some cases of dysmenorrhœa, in irregular and profuse menstruation accompanied by pain. The diseases of women in which it is useful, are those associated with painful contraction of the pelvic muscles.

VIBURNUM OPULUS.

Preparation.—Tincture of Viburnum Opulus.

Dose.—From the fraction of a drop to ten drops.

Therapeutic Action.—This species has a somewhat similar influence to the other, and may be used to prevent or arrest abortion or miscarriage. It would be selected when spasmodic action or cramp of the muscles is a special feature. Hence the common name of the remedy: cramp bark.

It will be found a valuable remedy in dysmenorrhœa, and in many painful affections of the pelvic viscera. It relieves irritation, promotes a normal circulation and nutrition.

DIVISION X.

CLASS XIX.

ANTISPASMODICS.

Antispasmodics may be defined to be those agents which counteract spasm. They may be justly divided into two classes, the *direct* and the *indirect*, though we have no positive proof that there are any agents possessing direct antispasmodic properties.

The mode in which these agents act is involved in much obscurity. So much so, that very different views are held by different authors. By some they are classified with narcotics, others class them with diffusible stimulants, others with special stimulants, while others again have determined that they are sedatives, admitting at the same time that their first effect is stimulant.

Action of Antispasmodics.—In attempting to solve the problem, of how this class of agents act, we will first have to notice the cause of convulsion or spasm. Spasm may arise in two different ways; first, as an exaltation of the natural irritability of the muscular fiber; and second, from an irritation of the nervous centers.

Muscular fiber is endowed with the peculiar property of *irritability*, or contraction on the application of some stimulant. This property may be either increased, or diminished In the first instance we may have an excessive contractility or spasm, from the influence of a slight stimulus; we have an example of this in the irritability of the bowels in *lientery*, where the action is so rapid that the food is passed through the intestines so rapidly that it can not undergo the digestive process. Again we have it in the *tonic* spasm or *cramp*, in which the contraction is not alternated with relaxation. "Such spasms," says Dr. Williams, "are not unfrequently felt in the calves of the legs; and in the different muscular canals, the gullet, the stomach, the intestines, and the glottis, which occasionally present this state of continued contraction. In most of these cases, it is accompanied by pain more or less severe, and may lead to serious obstruction to the function of the organ. When in a more moderate degree affecting the voluntary muscles generally, it constitutes catalepsy, in which, from the muscles remaining contracted, the limbs will retain whatsoever attitude they are placed in, until the spasm is over. But the extreme example is *tetanus*, in which the spasms are so violent and so enduring, that they may be said to squeeze the patient to death. The pathological cause may be, either an irregular supply of blood to the muscle, or irritation, direct or indirect, of the motor nerves by which the muscles are excited."

It is obvious that in this case *sedatives* will prove valuable antispasmodics. They lessen the irritability of the muscle, and also its stimulant to action. The efficacy of lobelia and other emetic agents, in the more severe cases of this kind, is to be ascribed in part to its sedative influence, to the severe shock produced upon the system, and to its equalizing the circulation. These, however, are but temporary means, and our main dependence for a radical cure will have to be placed upon such agents as will give tone and strength to the entire system.

The second cause of convulsions or spasms is an irritation of the nervous centers, either *centric*, arising within the nervous matter; or *eccentric*, the irritation being transmitted to the spinal cord from some other portion of the system. Inflammation or other disease of the brain and spinal cord, or their membranes, may give rise to the first variety, as in apoplectic and epileptic convulsions arising from disease of the brain, convulsions arising from spinal meningitis, etc. By an *eccentric* irritation, we understand one that exists in some other portion of the body, but which is transmitted to the spinal cord by the sensitive nerves, and gives rise to a *reflex* action. Such we have in the convulsions arising from teething, from worms, from acrid matters in the alimentary canal, from uterine or renal irritation, etc. Again, we may suppose that the same result would follow from *mal-nutrition*, as we observe in chorea, in some cases of epilepsy, etc. Here, undoubtedly, the disease exists in the blood; it either fails to supply a proper quantity and quality of nutritious matter to the nervous system; or else it contains an irritant material capable of exciting a reflex action of the spinal cord.

"When these phenomena," says Dr. Williams, "are general or extensive, as in convulsions, tetanus and paraplegia, we must refer them to an undue excitement or erythism of the spinal and prolonged medulla; but the more partial examples, as palpitation of the heart, and spasm of the bronchi, from intestinal irritation, etc., may arise from similar excitement of a small portion of it only, or of the incident nerve of the part which occasions the phenomenon, or of the excito-motory nerve of the part which exhibits the phenomenon.

"If we seek to know the causes of this excitement, we shall find that, as in excess of other vital properties, it is sometimes referable to an increased flow of blood through the spinal marrow or its nerves, or the branches of the sympathetic nerve. Thus the early stage of inflammation of the spinal cord or of its sheath, is attended with convulsions or tetanic spasm. It is very probable that the spinal excitement (convulsions) occurring in epilepsy and apoplexy, is in part due to the flow through the medulla being increased in proportion as that through the brain is impeded; a consideration of the causes of convulsive paroxysms, and of the distribution of the vertebral arteries, much countenances this supposition. But in many cases, the excitement seems to be of a more direct nature. Strychnia, in a poisonous dose, excites the medulla so speedily, causing tetanic spasm, that its effect can scarcely be due to increased flow of blood. So, too, we know that mechanical irritation of the spinal marrow, or of its nerves, will cause convulsive motions; and we find this exemplified in the effect of tumors and spicula of bone in the spinal canal, in the head, or in the course of nerves. But nothing exhibits this element of nervous irritation (apart, so far as is yet known, from vascular influence) so fearfully as traumatic tetanus. The irritation here begins in a distant nervous branch, and is propagated to the medullary center, the excito-motory function of which at length exhibits a state of erythism which destroys life either directly by tonic spasm of the muscles of respiration, or by exhaustion.

"Another cause which may be fairly assigned for increase of the involuntary excito-motory property, is accumulation by rest. This causes the augmentation of this property in he medulla, in narcotism from opium, and in injuries of the spine, which suspend the exhausting influence of volition on the whole or part of the marrow, in which the nervous energy therefore accumulates, and becomes unusually abundant. There is a natural increase of this property in sleep, which, by suspending the sensorial functions, augments the energy of those of the medulla; and this accession of power, which maintains the movements of respiration during sleep, also disposes to the occurrence of spasmodic attacks at this time; hence the fits of epilepsy and asthma commonly come on during sleep. So, likewise, sedentary habits and too much indulgence in sleep, may cause an accumulation and morbid excess of involuntary nervous power, and develop convulsive and spasmodic symptoms, which are the result of its overflow.

From what has been stated above, it will be seen that almost all classes of the materia medica may furnish articles which will prove antispasmodic under certain circumstances. If spasm depends upon an irritation of the spinal cord, its membranes or nerves, such agents as tend to remove this irritation are indicated. If it depends upon an unequal circulation, those remedies which counteract this condition will prove useful. If it depends upon an eccentric cause of irritation, as morbid material, worms, etc., in the alimentary canal, the agents that will remove them prove the most valuable antispasmodics. And lastly, if it depends upon the condition of the circulating fluids, this will have to be changed.

The agents generally classed as antispasmodics, as the musk, castor, asafœdita, galbanum, etc., are probably beneficial on account of their gently stimulant and soothing influence upon the system. They are valuable in cases of eccentric convulsions, from the fact that such cases are frequently caused by irritation of the alimentary canal, and these agents allay such irritation. They may probably owe their beneficial effect in hysteria in part to the same cause; but there can be no doubt that their slightly stimulant influence, and the impression made upon the mind of the patient, have much to do with their antispasmodic powers.

CHLOROFORM.

Chloroform, fully considered under the head of anæsthetics, deserves a first place in this list, for it may be successfully employed when internal remedies can not be given. Used as an inhalation it is one of the most powerful antispasmodics in the materia medica. Whether it is a case of convulsions in children, an attack of epilepsy, hysterical convulsions, or the greatest of all, puerperal convulsions, its action is very certain. It relieves irritation of the cerebro-spinal centers, and relaxes the muscular system.

Its use is safer than might at first appear. The physician gives it with an abundant supply of air, and as it is administered the breathing becomes easier, the pulse better, and the muscular system commences to relax. The convulsion passes off before anæsthesia occurs, and the inhalation is then suspended, or used in less quantity.

In infantile convulsions, we frequently meet with cases when it is impossible to give anything by mouth. Here in place of the olden times hot bath, and enema, chloroform is sprinkled upon a napkin and held to the nose, and in a brief time the spasm subsides, and the child can take the proper remedy.

ÆTHER SULPHURICUS.

THERAPEUTIC ACTION.—Sulphuric Ether is a very powerful and speedy excitant and antispasmodic, and is very well adapted to the relief of painful spasmodic affections, attended with a pale, cold skin, small feeble pulse in the absence of local vascular excitement or inflammation. As an excitant the reader is referred to this article under that class. Among the numerous cases of spasm in which it may be properly employed may be named that of the stomach or bowels, singultus, convulsive hysteria, subsultus tendinum, flalulent colic, tetanus, spasmodic asthma, spasm of the ureters or hepatic ducts, preventing the passage of renal or biliary calculi, etc.

In the advanced stages of continued fevers after assuming a typhoid type, and when attended with hiccough and subsultus tendinum, it often affords great relief. It has been used half an hour before the expected paroxysm of intermittent; it causes diaphoresis and prevents the attack.

Nervous headache, occurring in nervous females, as well as in many other cases when unattended with cerebral excitement, is often promptly relieved by its use. It is recommended in sea-sickness, taken in wine. Durande has recommended it as a solvent of biliary calculi, in which he combines three parts of ether with two of oil of turpentine. Bourdier used it to expel the tape-worm; he employed it by the stomach and rectum in an infusion of male-fern, following one hour after with a dose of castor oil.

Ether is frequently employed in spasmodic asthma, pertussis, dyspnœa, chronic catarrh, phthisis, etc., in the form of inhalation. For this purpose it may be dropped on sugar and held in the mouth, or dropped into warm water or some medicated liquid, and the vapor inhaled. The ethereal tincture of Conium maculatum has been used as an inhalation in phthisis, spasmodic cough, etc.

CHLORAL.

Hydrate of chloral will be found an excellent antispasmodic when the convulsions are due to an extrinsic irritation, or to a state of hyperæsthesia of the spinal cord. The evidences of such irritation will sometimes be found by getting a history of the case, by our knowledge of the exciting cause, or by the evidences of pain in the contraction of the facial muscles.

For children the solution may be of the strength of one or two drachms to two ounces of water, the dose being a teaspoonful frequently repeated until relaxation occurs. For the adult the dose will be from ten to twenty grains.

This remedy must not be used where there are evidences of cerebral anæmia.

MORPHIA.

The hypodermic injection of morphia is the most certain remedy we have in puerperal convulsions, or in any case (adult) where the convulsion has been preceded by severe pain.

In puerperal convulsions time is wasted in trying to give internal remedies which may not be absorbed if they reach the stomach, or may be ineffectual if absorbed. Chloroform is a very certain remedy, but there are some cases that it will not control, and others in which its use must be maintained too long. The hypodermic injection is certain, speedy in its effect, and the relief continues.

The injection should be of the common solution, gr. x. to water ℥j., in quantity so that the patient shall have from one-fourth to one-third grain. It may be repeated if a first injection is not sufficient.

GELSEMINUM.

THE ROOT OF GELSEMINUM SEMPERVIRENS.

PREPARATION.—Tincture of Gelseminum.

DOSE.—From the fraction of a drop to half a drachm.

SPECIFIC INDICATIONS.—The face is flushed, the eyes bright, the pupils contracted, the patient restless and uneasy, the head hot.

THERAPEUTIC ACTION.—With these indications, there is no remedy superior to the Gelseminum as an antispasmodic. In many cases the practitioner is warned of the coming convulsion in time to relieve the irritation which causes it. A child will have fever with the symptoms of determination to the brain above named; if allowed to progress convulsions will result. The physician notes the symptoms, gives Gelseminum in small doses, the irritation is relieved, the fever passes away, and the convulsions avoided.

In infantile convulsions it is used to arrest the convulsions when these evidences of irritation are present. Here the dose may be larger, and repeated until relaxation and relief is obtained.

We use it in the treatment of hysteria when these symptoms present. When the indications are present it gives speedy relief.

It is not so certain in puerperal convulsions, but there are many cases in which its timely administration will effect a cure.

LOBELIA.

Lobelia is one of our most powerful antispasmodics, and is adapted to a class of cases that show symptoms opposite to those which would indicate Gelseminum. There is a full and oppressed pulse, or a feeble pulse, oppressed respiration, and the countenance has lost all expression, is full and sodden.

In these cases we give it alone or with a stimulant, as Capsicum, until nausea and complete relaxation is produced. It is a very unpleasant remedy to take, and very unpleasant in its action, and for this reason we use other means when we can.

It is especially good in hysteria because it is unpleasant. Its nastiness stimulates the will, and if a patient knows that Lobelia and Capsicum is coming, she will make a powerful effort to control the hysterical manifestations.

ASAFŒTIDA.

THE GUM RESIN OF FERULA ASAFŒTIDA.

PREPARATION.—Tincture of Asafœtida.

DOSE.—In substance, grs. ij. to grs. x ; of the tincture, ʒss. to ʒj.

THERAPEUTIC ACTION.—Asafœtida is described as antispasmodic, stimulant, laxative, expectorant, emmenagogue, anthelmintic and nervine.

It acts as a general excitant, causing increased frequency of the pulse, respiration is quickened, the temperature is augmented, the bowels are excited to action, alvine mucous secretions are promoted, as well as from the bronchial mucous membrane, headache and vertigo are experienced, irritation in the genito-urinary organs, with an increased venereal propensity.

Its utility is generally admitted in spasmodic and convulsive disorders in which the functions of the excito-motor system are involved. It appears to be a nervous stimulant, its peculiar excitant action being manifested upon the brain and nervous system. It is slowly absorbed, as is manifested by the alliaceous odor emanating from the different secretions.

SAGAPENUM.

Dose.—In pill or emulsion, grs. v. to ℈j. or ʒss.

Sagapenum is supposed to be derived from one species of the asafœtida plant. Its properties are similar to asafœtida and other gum-resins. It is regarded, however, as holding an intermediate rank between the asafœtida and galbanum. It is occasionally employed as a stimulating antispasmodic and emmenagogue, in hysteria, amenorrhœa, chlorosis, and some other kindred diseases, but is now seldom used, and scarcely merits a passing notice.

AMMONIACUM.

THE GUM RESIN OF DOREMA AMMONIACUM.

Dose.—From ten grains to half a drachm, in pill or emulsion; emulsion is preferable.

Therapeutic Action.—Ammoniacum is antispasmodic, stimulant, expectorant, laxative, diaphoretic, diuretic, and emmenagogue.

Ammoniac is applicable to the same cases in which the asafœtida and other fetid gum-resins are indicated. It occasionally promotes the secretions, as diaphoresis, diuresis, and the menstrual discharges.

Although we arrange this agent under the class of antispasmodics, and among the fetid gum-resins, yet it is more frequently employed as an excitant expectorant in chronic pulmonary affections, such as chronic catarrhs, the asthma of old persons, etc., with profuse secretion from debility of the vessels, or in chronic coughs and pectoral disorders with deficient expectoration.

GALBANUM.

THE GUM-RESIN OF GALBANUM OFFICINALE.

Dose.—From ten grains to half a drachm, in pill or emulsion, prepared by triturating it with gum arabic and loaf sugar.

Therapeutic Action.—Galbanum is antispasmodic, stimulant, expectorant and emmenagogue.

The medical properties and effects of this agent are analogous to those of the fetid antispasmodic gum-resins already noticed. It appears to occupy an intermediate rank between the asafœtida and gum ammoniacum, it being less energetic than the former, but stronger than the latter.

As a stimulant to the vascular system, it is said to surpass the asafœtida; but as an antispasmodic, it is greatly inferior to that drug. The Germans have ascribed a specific stimulant influence to it over the uterus. It is less frequently employed than asafœtida or ammoniacum, and but rarely used in the United States. It is more especially adapted to relaxed and torpid habits, while it is inadmissible in febrile and inflammatory states of the system.

CASTOREUM.

Dose.—From grains x. to xx., in pill or emulsion.

Therapeutic Action.—Castor is described as antispasmodic, stimulant and emmenagogue. It has been employed in medicine for many centuries.

The views of different writers as to the efficay of castor seem to be somewhat discrepitant. Mr. Alexander Jorg and his pupils, both males and females, experimented with it, took it themselves and gave it to others, and watched its effects, and assert that no visible impression was manifested, except that the odor of castor was evolved from the stomach by eructations that followed its exhibition.

MOSCHUS.

Dose.—From one-half to five grains.

Therapeutic Action.—Musk is described as antispasmodic, stimulant, narcotic and aphrodisiac. It acts peculiarly upon the brain and nervous system, producing an exaltation of the cerebral nervous energies, at the same time acting as a diffusible vascular stimulant, and secondly as a narcotic.

The particular diseases calling for the use of Musk are hysteria, chorea, epilepsy (especially of children), tetanus, hydrophobia, pertussis, low fevers, or typhoid stage of continued and exanthematous fevers, typhoid pneumonia, etc., attended with delirium, subsultus tendinum, singultus and tremors.

AMMONII BROMIDUM.

Dose.—The usual dose of this salt for an adult is ten to fifteen grains, but it may be increased to thirty grains. For a child of two to four years the dose may be from three to five grains. We employ it in solution.

Therapeutic Action.—Bromide of Ammonium is one of our most certain and useful antispasmodics, influencing the brain and spinal cord directly. Whilst bromide of potash is sedative and depressant, this is a mild stimulant. The indications for its use are the involuntary movement of muscles and tendency to loss of consciousness.

We employ it in the treatment of convulsions of children, both to prevent when threatened, and after they have passed off to prevent recurrence. It would not be the case asking for Gelseminum, Rhus, Lobelia, or Belladonna, or the case carrying a high temperature. When children are subject to convulsions, I know of no remedy equal to this to be given on their first appearance.

It is probably the most certain remedy of the materia medica in the treatment of epilepsy, and if we selected a remedy empirically, it would be this. The usual proportion is, Bromide of Ammonium ʒss, water ℥iv.; a teaspooful four times a day. But many cases will require double or treble this quantity to antagonize the tendency to convulsions. If it holds these in check, it must be continued for months, until the morbid habit is broken up.

OLEUM ANIMALE EMPYREUMATICUM.

Dose.—Five to twenty drops on sugar or dissolved in water.

Animal oil is a powerful agent, acting as an energetic poison, both as a local irritant and as a narcotic. It is esteemed antispasmodic, narcotic and excitant to the vascular and nervous systems. Hysteria, epilepsy, ague, typhoid states of the system, spasmodic and convulsive disorders, and other nervous affections, are among the diseases in which it is said to have been found beneficial.

VALERIANA.

THE ROOT OF VALERIANA OFFICINALIS.

PREPARATION.—Tincture of Valerian.

DOSE.—From one drop to half a drachm.

THERAPEUTIC ACTION.—Valerian is antispasmodic, nervine, tonic, narcotic, and stimulant. It acts as an excitant to the cerebro-spinal system. If taken in large doses, headache, giddiness, mental excitement, optical illusions, as flashes of light passing before the eyes, restlessness, nervous tremors, and in some cases spasmodic action, follow its exhibition.

Valerian at one time enjoyed a high reputation as a nervous excitant and antispasmodic. The diseases in which it has been principally used are those of a nervous character, such as epilepsy, chorea, hysteria, hypochondriasis, ataxic fevers, attended with restlessness or morbid vigilance, nervous headache, neuralgia, and other neuroses dependent upon increased susceptibility of the nervous system, and not on organic derangements or permanent irritation. It has attained considerable notoriety in epilepsy, but its virtues in that disease have undoubtedly been overrated.

Associated with Macrotys, it is an excellent remedy in chorea, and probably this is its best use. We give both in full doses, and continue until the patient has full command over the muscular system.

CYPRIPEDIUM.

THE ROOT OF CYPRIPEDIUM PUBESCENS.—U. S.

PREPARATION.—Tincture of Cypripedium.

DOSE.—From five drops to one drachm.

THERAPEUTIC ACTION. — Cypripedium is antispasmodic, nervine, tonic, stimulant, and diaphoretic. In numerous affections termed neuropathic, or nervous, we have employed the Cypripedium with decided advantage. It equalizes and energizes the nervous powers, lessens excitement, allays nervous irritability, alleviates pain, and appears to invigorate both mind and body, leaving the patient more cheerful and lively than when any of the narcotics or many of the antispasmodics are prescribed.

The diseases in which it is indicated are hysteria, or chronic hysteroid affections, hypochondriasis, delirium tremens, chorea, epilepsy, hemicrania, neuralgia, ataxic or nervous fevers, and that vast train of nervous disorders or derangements of the nervous functions concomitant to many acute as well as most chronic diseases. In low fevers accompanied with morbid nervous excitability, or irritability, as manifested by restlessness or inquietude, with vigilance or morbid watchfulness, and great sinking of the vital powers, Lady's-slipper allays nervous excitement, produces a calm or tranquil state of mind, invigorates the system, and favors sleep.

SCUTELLARIA.

THE HERB SCUTELLARIA LATERIFLORA.—U. S.

Preparation.—Tincture of Scutellaria.

Dose.—From five drops to half a drachm.

Therapeutic Action.—Scutellaria is antispasmodic, nervine, and tonic. Scullcap is peculiarly available in diseases of a nervous character. While it acts as a tonic, invigorating the powers of the digestive organs and augmenting the energies of the general system, its nervine and antispasmodic properties point to it as a useful remedy to allay morbid irritability of the nervous system. It is but little used in violent spasmodic action; nevertheless, it is well adapted to the relief of that morbid state of the nervous system upon which spasm depends.

JEFFERSONIA.

THE ROOT OF JEFFERSONIA DIPHYLLA.

Preparation.—Tincture of Jeffersonia.

Dose.—From five drops to half a drachm.

Therapeutic Action.—Twinleaf is antispasmodic, stimulant, expectorant, diaphoretic, diuretic and alterative. Jeffersonia has been employed in many of the nervous and spasmodic diseases in which the remedies of this class are used. Thus it has been used in epilepsy, chorea, hysteria, etc., with reputed advantage. Its effects are not immediate. It appears to act by changing the peculiarly irritable condition of the nervous system, upon which spasmodic disease depends.

It has proved efficacious in many cases of chronic rheumatism, especially in that form denominated chronic mercurial rheumatism. Its utility seems to depend upon its stimulating, diaphoretic, diuretic, and alterative action. From the success which has attended its exhibition in syphilitic and mercurial affections, there can be no doubt that it is an important alterative, and we are confident it will be found such in many chronic affections requiring the use of this class of agents.

EUPATORIUM AROMATICUM.

THE ROOT.

Preparation.—Tincture of Eupatorium Aromaticum.

Dose.—From five drops to half a drachm.

Therapeutic Action.—This species of Eupatorium is antispasmodic, nervine, diaphoretic, and expectorant. It is esteemed a valuable nervine and antispasmodic, and one peculiarly adapted to many cases of debility and irritability of the nervous system, such as hysteria or hysterical affections, chorea, tremors, convulsive or spasmodic diseases, subsultus tendinum, restlessness and morbid watchfulness, etc., occurring in the advanced stages of fevers. In many of these nervous disorders we have combined it with Cypripedium or Ictodes with decided advantage.

It is valuable as a diaphoretic and expectorant. It may be freely exhibited in all febrile and inflammatory diseases as a diaphoretic; the warm infusion should be taken very freely, and to render it more stimulating, the Aristolochia may be combined with it.

ICTODES.

THE ROOT AND SEEDS OF ICTODES FŒTIDA.

Preparation.—Tincture of Ictodes.

Dose.—From ten drops to one drachm.

Therapeutic Action.— Ictodes is antispasmodic, nervine, stimulant, expectorant, narcotic, diaphoretic, emmenagogue, and anthelmintic.

It appears to be a valuable nervine and antispasmodic, and as such it may be used advantageously. We have found it decidedly useful in hysteria. It has answered a valuable purpose in our hands in many instances, in removing that morbid state of the nervous system so frequently met with in weak and delicate females, who are the subjects of frequent hysterical attacks. In such cases, it often affords relief after other agents fail. The tincture or infusion may be administered several times daily ; or the tincture combined with the tincture of asafœtida, will be found a useful compound. In various other affections of a nervous character, such as chorea, epilepsy tremors, etc., it not unfrequently proves serviceable in allaying nervous irritation.

PÆONIA.

The root, flowers and seeds of the Pœonia have been used since the days of Galen as a remedy in epilepsy. For this purpose the root was cut into sections, attached to a string and worn about the neck, as an amulet or charm. It has been used in some other forms of neuroses, as palsy, convulsions, etc., but its action is feeble and is mostly abandoned. Willis recommends the seeds in the incubus of hydrophobic patients.

OLEUM SUCCINI.

DOSE.—From five to fifteen drops, increased to thirty drops, in aromatic water, with the addition of gum arabic and sugar.

The volatile Oil of Amber is a highly stimulating antispasmodic. It promotes the secretions, and when applied locally is highly irritating to the parts, and acts as a rubefacient. The diseases in which the Oil of Amber has been employed beneficially, are those of a nervous character ; more especially in those attended with spasmodic or convulsive movements. In the chronic forms of hysteria, and in infantile convulsions arising from dentition, intestinal irritation or worms, also in pertussis, this oil has been advantageously employed.

OLEUM CAJUPUTI.

DOSE.—From five to ten drops, on sugar or in emulsion.

Cajuput Oil is a powerful antispasmodic, diffusible stimulant, and sudorific. In many of the violent painful spasmodic affections of the stomach and bowels it is a very efficacious remedy, also in flatulent colic and tympanitis.

As a diffusible stimulant, it has but few, if indeed any superiors. In typhoid, adynamic, or ataxic fevers, where there is great depression, great sinking of the vital powers, and where a speedy reaction, an exaltation of the vital manifestation, is desirable, this oil, as a prompt and energetic diffusible stimulant, is one of the most certain that can be employed. Its potent stimulant, antispasmodic, and sudorific properties have secured for it a high reputation in the treatment of Asiatic cholera. It was used in the season of 1849, in that epidemic, associated with the oil of peppermint, cloves, anise, and alcohol, in the form of Hunn's Life Drops, with great advantage.

VIBURNUM.

THE BARK OF VIBURNUM OPULUS.

PREPARATION.—Tincture of Viburnum O.

DOSE.—From the fraction of a drop to half a drachm.

The bark of High Cranberry is antispasmodic, nervine, and tonic. It is very efficacious in relieving spasmodic pains by relaxing the spasm, as in cramp or spasm of the stomach and bowels. It is also useful as a tonic and nervine, and may be used in debilitated states of the system, accompanied with nervous irritation.

DIVISION XI.

CLASS XX.

ANTHELMINTICS.

Anthelmintics may be defined to be agents which destroy or expel worms, or prevent their formation and development. They accomplish this in different ways:

1st. They may act as poisons to the worms, and this is the effect which many of the direct or specific vermifuges undoubtedly have. They may directly kill the worms, or so weaken or deaden them that they can not retain their position in the bowels, especially if the peristaltic action is increased by the action of a brisk cathartic. As examples of this class of anthelmintics, we may notice the spigelia marylandica, or pink-root, the chenopodium anthelminticum, artemesia santonica, aspidium felix mas, and, according to some authorities, the mucuna pruriens, or cowhage, and the pulvis stanni, or tin filings.

2d. Active and continued purgation may remove them, either by cleansing the stomach and bowels of the increased quantity of mucus and other matter upon which they subsist, and which forms their nidus; or by so debilitating them that they are rendered incapable of maintaining their position against the augmented peristaltic action of the intestinal canal, while under the influence of a powerful drastic cathartic.

3d. They may act directly upon the worms and disorganize or destroy them simply by their mechanical influence. Some of the anthelmintics of this class have been supposed to pierce the worms, and thus destroy them; the cowhage is an example of this kind. Drastic cathartics may also act as mechanical irritants, and destroy and remove them. They are also removed by the asperity of some of the metallic agents, as the ferri ramenta, tin filings, etc.

4th. Tonics may exert an indirect influence upon them that will tend to prevent their generation, and to their destruction and expulsion if they do exist. They doubtless act as prophylactics by invigorating the digestive organs, and removing that morbid condition which favors their generation. The deranged state of the digestive organs when the patient is infested with worms, would justify us in coming to the conclusion that a very morbid condition of the intestinal canal does exist when they are present. Their connection, says Dr. Joy, with a debilitated state of the constitution, and in many cases with a scrofulous habit, seems to be pretty well made out. The inactivity of the lacteal and absorbent vessels, and the consequent accumulation in the intestines of chyle and mucus, which form so congenial a food or so favorable a nidus for these animals, together with the generally weakened condition of the digestive organs in strumous patients, enable us in some degree to comprehend this cause; yet it is indubitable that they are also met with in the robust and healthy. Rush has even endeavored to make it appear that they are indicative of, or almost essential to the possession of perfect health; in which opinion, however, he has but few followers. It would seem that whatever produces a redundancy and stagnation of nutritive or animalized fluids in the intestinal tube—whether it be a too abundant supply of food, too active a chylification, or too great a secretion of mucus—is to be ranked among their causes. If, then, a morbid condition of the alimentary canal is a predisposing cause of worms, we should expect that such agents as would remove this condition would also cause the removal of worms, and prevent their regeneration. By the free use of tonics we accomplish these indications, we invigorate the digestive organs, and prevent the formation of this morbid accumulation, which is conducive to their generation, and upon which they subsist. Several very valuable tonics have been considered as among the best anthelmintics, as the chelone, tansy, quassia, gentian, iron, etc.

5th. Some of the alkaline and acid agents act as prophylactics, and not unfrequently remove or destroy worms. They probably act by dissolving the intestinal mucus, upon which the worm subsists, or by counteracting the production of the vitiated accumulations which favor their generation and growth.

There are some very effective anthelmintics, as the corsican, wormwood, male fern, etc., that exert no very visible influence upon the human system. It may be somewhat difficult to explain satisfactorily their modus operandi, but we suppose they must act as poisons to the worms. Though they produce no very perceptible effect upon man, yet that is no reason that they do not prove most virulent poisons to these *entozoa*.

"Of the medicines enumerated under the head of specific anthelmintics," says Dr. Joy, "several are of a highly dangerous nature, and, we repeat it, quite disproportioned to the importance of the malady; and some of the rest have a doubtful claim to the place which they occupy. Thus, it is very uncertain whether the salts of iron, as well as bitters and mineral acids, do not owe the whole of their beneficial influence, not to any direct or immediate impression on the worms, but to their gradual effect in improving the tone of the stomach and intestines. The employment of such measures as strengthen the body, constitutes by much the most important part of the treatment of worms, as it tends not only to prevent their formation, but also to remove the irritable state of the system so often present, and to add energy to the various functions, on the imperfect performance of which, much more than the presence of these animals, the troublesome symptoms depend. A diet consisting of food of easy digestion, and so restrained in quantity as to insure its perfect assimilation, along with a healthy habitation, a dry atmosphere, and regular exercise, will often, alone or with the aid of the mineral and vegetable tonics, prove perfectly sufficient to attain the desired end. If, however they fail, and the evidence of the existence of worms and of their inducing irritation in the system, continues strong, the employment of some of the best established and safest of the anthelmintic medicines becomes justifiable. If a scrofulous diathesis, as is so often the case, co exists, all those means which we know to be useful in its management must be simultaneously brought into action. As to the nervous affections which form the great bulk of those fairly traceable to worms, we must endeavor to palliate them as they arise, by the use of a mild and demulcent diet, the tepid bath, and other antispasmodic remedies, until we can succeed in removing their cause by the means just alluded to."

CHENOPODIUM.

THE SEEDS OF CHENOPODIUM ANTHELMINTICUM.

DOSE.—Oil of Wormseed, from ten to twenty drops.

THERAPEUTIC ACTION.—Wormseed is anthelmintic, antispasmodic, and emmenagogue. It is considered one of our most efficacious indigenous anthelmintics. It is employed for the destruction of all kinds of worms, but especially for the lumbricoid.

A dose may be prescribed morning and evening, on an empty stomach, for three or four days, and then followed with a brisk cathartic, and if necessary repeated until the desired object is accomplished.

SPIGELIA.

THE ROOT OF SPIGELIA MARILANDICA.

THERAPEUTIC ACTION.—Spigelia is anthelmintic, cathartic, and narcotic. Its anthelmintic powers, it would seem, are mostly restricted to the lumbricoid worm, as it does not prove very destructive to other kinds of entozoa. It acts as a poison to them, owing, probably, to its narcotic powers.

ARTEMISIA SANTONICA.

THE TOPS AND SEEDS.

DOSE.—Of the powdered Worm-seed to children, from grs. x. to ʒss.; to adults, ʒss. to ʒij. two or three times a day.

This agent has been considered a very efficient anthelmintic, especially for the expulsion of the lumbricoides, and the ascaris vermicularis. It is prescribed in the form of powder, infusion, extract, or electuary.

SANTONIN.

Dose.—In administering the Santonin, we combine it with white sugar, equal parts, of which the dose is from one to five grains for children one or two years of age; for an adult, from two to ten grains of the compound.

Santonin, the active principle of Artemisia Santonica, is obtained in white, four-sided prisms, very brilliant, without odor or taste; it is soluble in alcohol and ether, but insoluble in water.

Therapeutic Action.—Santonin is considered by many one of the most efficient anthelmintics, and yet the least dangerous that can be administered to children. We have employed it for this purpose, and so far have been highly pleased with its action. As it is tasteless, it possesses great advantage over many other agents. When given for this purpose, it should be followed by a cathartic sufficient to produce two or three free evacuations from the bowels.

Santonin, however, possesses other properties which render it of much more value as an anthelmintic. In suppression of urine, especially in children, we know of no agent so valuable; when administered in doses of from one-half to two grains we have never as yet seen it fail to produce the desired result. It is also the most efficient single agent we have ever employed in relieving that irritation, pain, and scalding sensation in the base of the bladder and urethra, that so frequently accompanies uterine disease. We have also used it with advantage in chronic nephritis and albuminuria.

ABSINTHIUM.

THE FLOWERING HERB ARTEMISIA ABSINTHIUM.

Dose.—From twenty to forty grains, in substance.

Absinthium is tonic and anthelmintic, and when externally applied is said to be discutient and antiseptic. It is sometimes used as an anthelmintic to expel the ascaris vermicularis and lumbricoides, but is not in general use. For a full description of its properties, see tonics.

FILIX MAS.

THE ROOT OF ASPIDIUM FILIX MAS.

DOSE.—One to three drachms, in the form of pill, electuary, or emulsion, morning or evening, or evening only, for two or three days on an empty stomach, and follow with a brisk cathartic. Decoction, one ounce to a pint of water, in three or four doses.

THERAPEUTIC ACTION.—The Male Fern possesses anthelmintic properties of superior efficacy, according to the testimony of some authors. It is also said to be slightly tonic and astringent.

At the present day it is mostly prescribed to destroy tænia or tape-worm, but it is said to have been employed with success for destroying lumbrici, and the tricocephalus also. It may be administered in the form of powder, decoction, ethereal extract, or ethereal tincture of the buds.

FUCUS HELMINTHOCORTON.

THE PLANT.

DOSE.—In powder, from ten grains to two drachms, in the form of an electuary.

THERAPEUTIC ACTION.—The Fucus Helminthocorton, or Corsican Moss, is employed in Europe as an anthelmintic, but is seldom, if ever, used in this country. It is said to produce scarcely any appreciable influence upon the system; but is said to act very powerfully on intestinal worms. It is mostly exhibited to children for the expulsion of the lumbricoid worm.

KOUSSO.

THE DRIED FLOWER TOPS OF BRAYERA ANTHELMINTICA.

Kousso is an anthelmintic, and has gained a great reputation as a means of expelling tape-worm.

"It is generally administered in the following manner: Half an ounce of the powdered flowers are to be mixed with ten ounces of luke-warm water, and infused for about a quarter of an hour. for an adult. A little lemon juice is then to be added and it sweetened, and the infusion being stirred up, the whole (both liquid and solid) is to be swallowed at two or three draughts, at short intervals, being washed down with cold water and lemon-juice. To promote the operation, tea (without sugar or milk) may be taken. In three or four hours, if the bowels have not operated, a dose of castor oil or a saline purgative should be administered. When given to children, a smaller dose may be used—from a drachm upward." —*Thompson.*

AZEDARACH.

THE BARK OF THE ROOT OF MELIA AZEDARACH.

Dose. — In substance, twenty grains. Decoction, four ounces to two pints of water, boiled to one pint. The dose to a child is half an ounce, every two or three hours, until it produces vomiting or purging.

Therapeutic Action.—Azedarach is anthelmintic, emetic, and cathartic, and in large doses said to be acro-narcotic.

The fresh bark of the root, if taken in large doses, not unfrequently produces vomiting and purging, but is rarely and perhaps never resorted to exclusively for such purposes. It is also said to be narcotic; and this property is more especially manifested if the bark is obtained in the months of March and April, while the sap is ascending to the branches.

The fresh bark of the root is an active anthelmintic, and as such is said to have become the most popular remedy among the people of the South.

GRANATUM.

THE RIND OF FRUIT AND BARK OF ROOT OF PUNICA GRANATUM.

Therapeutic Action.—Pomegranate Bark is said to be anthelmintic, astringent, emetic, cathartic and narcotic. All parts of the Punica Granatum are used for medicinal purposes, as the bark of the root, rind of the fruit, flowers, and juice surrounding the seed. All are astringent, owing to the presence of tannic acid.

The bark of the root, in small doses, produces no visible effects upon the system; but in full doses it occasions nausea, vomiting, and in some cases, giddiness and faintness, tremblings, and a sensation of intoxication, showing it is possessed of narcotic properties.

Prof. Locke has found Pomegranate almost a specific for tape-worm. He gives this formula: "℞ Take half a pound of bark from the Pomegranate root, add two and a half pints of boiling water, let the mixture stand in a warm place for at least two hours, then boil down to one pint, strain while hot through a fine wire strainer. To every six ounces of the decoction add one drachm of the fluid extract of Jalap and five drops of the Oil of Anise. Six ounces of the preparation is regarded as a dose; and the medicine should be given warm. It should be repeated every two hours until the worm is expelled. Three hours prior to the administration of the first dose the bowels should be evacuated by the action of a cathartic, none being better than our antibilious physic.

"In some cases the slender neck of the worm might be severed in the act of expulsion, and pass unobserved, though the death of the creature might be assured. The presence of the entire worm in the discharge is alone satisfactory. If the head of the parasite does not appear in the evacuation, it is best to administer a second dose of the medicine and await its action. If, at a subsequent period, it be known that the worm was being reproduced from the unexpelled and living head, a repeated trial of the medicine might be made, but I have not had a failure. If I ever fail with the dose recommended, I shall administer a larger one."

OLEUM TEREBINTHINÆ.

The oil of Turpentine is a popular, and may be justly considered an important anthelmintic for the removal or destruction of all kinds of entozoa. In addition to its vermifuge powers it possesses cathartic properties which give it additional claims to our attention in this case, for it renders the employment of others unnecessary in most cases when it is used in suitable doses.

It has been highly extolled for its efficacy in destroying the tænia or tape-worm. In cases of this kind it must be administered in doses sufficiently large to produce copious alvine evacuations. From one to three ounces may be given at once, the bowels being previously evacuated by an active cathartic, and if it does not operate in a few hours, followed with a large dose of castor oil.

It is very efficacious in cases of the lumbricoid worm; but the dose is much smaller. In this case a few drops may be mixed with sugar, or it may be made into an emulsion with the yolk of an egg, or some mucilage and sugar. In cases of choking, spasms, or convulsions arising from the presence of worms in the stomach, a few drops on sugar may be taken, and at the same time it may be rubbed over the stomach and breast with much advantage. In this way it often gives prompt relief.

MUCUNA PRURIENS.

THE HAIRS OF THE PODS.

DOSE.—From five to ten grains in molasses or syrup.

THERAPEUTIC ACTION.—The Mucuna is justly regarded as a powerful mechanical anthelmintic. It has long been celebrated for this purpose. It is evident that this agent acts mechanically from the effect which it exerts upon the worm after being removed from the body and brought in contact with it, and from the efficacy which it manifests in removing worms when administered internally.

The fact that worms are discharged alive when this agent has been employed is evidence that its anthelmintic powers are dependent upon its mechanical action, and that it acts by piercing and tormenting the worm.

DIVISION XII.

CLASS XXI.

SIALAGOGUES.

Sialagogues or masticatories act as topical excitants. They are pungent or acrimonious articles which when masticated cause a copious flow of mucus from the lining membrane of the mouth, and at the same time the orifices of the ducts of the salivary glands are excited, and this excitation is extended to the salivary glands whose secretory functions are greatly augmented and salivation is established.

They are local excitants and very limited in their curative influences upon the system. They act as revulsives and also as depletives. The new action which they set up in the salivary organs renders these glands the center of fluxion, and to them an increased determination of vascular and nervous excitement takes place—in this way they act as topical depletives and as revulsives. The copious secretion which they cause, greatly augments their derivative powers. In this way other organs in a state of undue excitement are relieved by withdrawing the excitement and concentrating it upon the salivary organs.

Therapeutic Application.—The more stimulating or pungent sialagogues are used as *masticatories* in toothache, headche, congestions of the brain, paralysis of the tongue or muscles of deglutition if the cause is local and not dependent upon some morbid state of the brain, facial neuralgia, aphonia, dysphonia, difficult deglutitition, etc., etc.

There are many vegetable agents that produce salivation The iodine, iris, calamus, cochlearia, zanthoxylum, sanguinaria, mezereon, capsicum, piper, nicotina, etc., are occasionally used as sialagogues. Some agents that act as nauseants are also used as sialagogues.

PYRETHRUM.

Dose.—As a masticatory, from ʒss. to ʒj.

Pellitory root is a powerful local irritant. If applied to the surface of the body it acts as a rubefacient. It is but seldom employed internally, although formerly exhibited as a gastric stimulant.

At the present time, it is resorted to almost exclusively as a masticatory and sialagogue, it being chewed in certain forms of headache, neuralgia, neuralgic and rheumatic affections of the face and head, toothache, etc. It is likewise used as a local stimulant in paralysis of the tongue, throat, and parts adjacent, as the muscles of deglutition.

ARMORACIA.

The root of Horseradish is a pungent, acrid stimulant, sometimes used as a masticatory in paralytic affections of the tongue.

It acts efficiently upon the salivary organs, causing a copious flow of saliva, while its exhalations excite a flow of tears. If taken internally it acts upon the general system as a stimulant, and as a diuretic and diaphoretic.

MEZEREUM.

The medical properties of the Mezereon have been fully described under the class of Alteratives. As a topical remedy it is sometimes used as a masticatory to relieve toothache, and difficult deglutition depending upon paralysis. It is a powerful acrid and excitant agent. In paralytic, rheumatic and neuralgic affections of the face, tongue, organs of deglutition, etc., a small portion of the bark is to be kept constantly in the mouth.

CALAMUS.

When masticated the root of the Sweet Flag acts as an excitant to the salivary organs. It may be used whenever a topical stimulant of this character is required, as in the rheumatic and paralytic affections about the mouth. The Calamus is occasionally substituted for tobacco, by those desirous of discontinuing the use of that nauseous agent.

ZINGIBER.

The rhizoma of Zingiber Officinale, or common Ginger, when masticated, causes a copious flow of saliva. It has been used to a limited extent as a masticatory in neuralgia, rheumatism, paralysis, etc., of the organs of deglutition and contiguous parts. It is, however, but little employed as a sialagogue.

TABACUM.

Tobacco is a very common masticatory and sialagogue. This article possesses properties differing very materially from other agents named as masticatories or sialagogues. It acts as an acro-narcotic poison, manifestly depressing the nervous system. Owing to its narcotic properties it is sometimes chewed to relieve toothache, rheumatic and neuralgic affections about the face and head.

XANTHOXYLUM.

The berries and bark of the Prickly Ash, when masticated, act as highly excitant agents to the mucous membrane of the mouth, occasioning a copious flow of mucus, while at the same time the salivary glands are aroused to increased action, and a flow of saliva follows. They are sometimes used in paralytic, rheumatic and neuralgic disorders of the vocal organs, organs of deglutition, and neighboring parts.

The Iris, Sanguinaria, Capsicum, Cubebs, Black Pepper and sundry other pungent and excitant agents, when masticated, cause an increased flow of saliva, and are applicable to the cases in which the preceding agents have been recommended.

CLASS XXII.

ERRHINES OR STERNUTATORIES.

These agents cause an increased secretion from the pituitary or schneiderian membrane and sneezing. The term sternutatory was formerly applied to those agents which produced sneezing—the two terms are now used as synonymous. The application of this class of agents is very limited. They are restricted to diseases of the head, and act as derivatives. They stimulate the pituitary membrane and cause an afflux to it, and an increased secretory action. By their topical excitant influence they render the pituitary mucous membrane the center of fluxion, and its mucous follicles are stimulated to an increased secretion. The same influence extends to the frontal, ethmoidal and sphenoidal sinuses, and also to the ductus ad nasum, by both a continuous and contiguous sympathy. In this way the secretion of tears is also greatly augmented, and there is consequently a derivation of the circulation from contiguous and adjoining parts. The copious secretion exerts its salutary influence not as a derivative alone but also as a *topical depletive.* Undoubtedly much of the advantage gained by the use of these agents in the diseases about to be named, is ascribable to this particular influence, though most authors attribute their sanative powers exclusively to their derivative influence. If the errhine be too strong, or if it remains in contact with the mucous membrane too long it arrests the secretion, yet its derivative powers are still manifest—showing that derivation is not the only way in which they prove beneficial; and proving most conclusively that the copious secretion, while it acts as a topical depletive, augments the derivative powers of the drug.

Therapeutic Application.—Their modus operandi at once suggests the cases in which they may be employed. By their excitation of the nasal mucous surfaces they produce a derivation of nervous and vascular action from adjacent and diseased organs. They frequently give relief in cases of cephalalgia by their revulsive influence and local excitant action upon the nasal organs. In catarrhal affections or in cases of obstruction in any of the nasal sinuses, sternutation is attended with advantage by removing the obstruction. In ophthalmia they are used occasionally with advantage. In disease of the ears, in rheumatic or paralytic affections of contiguous parts, they may be used with a prospect of benefiting the patient. They have also been used in toothache. In ulcers of various kinds, particularly in those of an indolent character they are indicated. Nasal polypi, concretions or tumors situated in the nose have frequently been removed by the use of those of a caustic character.

Those errhines that produce sternutation are *contra-indicated* in all cases where there is a predisposition to apoplexy, and whenever there is an undue determination to the brain. They are also contra-indicated in hemorrhages, aneurismal tumors, pregnancy, particularly if advanced and there is a predisposition to abortion, hernia, etc., for the very good reason that succussion attending the act of sneezing, acts violently and mechanically upon the organs implicated in the diseases referred to.

MYRICA.

The Myrica Cerifera, or Bayberry, is an indigenous shrub of much value as a medicinal agent. The finely pulverized bark acts powerfully as an errhine, for which purpose it is often used in neuralgia of the head and face, in cephalalgia or headache, catarrhal affections and ulcerated states of the pituitary membrane, obstructions of the ethmoidal, sphenoidal or frontal sinuses, chronic ophthalmia, obstructions of the ductus-ad-nasi, rheumatic affections of the face, and in various other local diseases of the head.

SANGUINARIA.

The pulverized Blood-root acts very efficiently as an errhine or sternutatory. It is employed in the same cases as the Bayberry, such as obstructions of the various sinuses connected with the nasal passages, catarrhal affections, rheumatic and neuralgic diseases, cephalalgia, ophthalmia, polypus, etc.

ASARUM EUROPÆUM.

The root and leaves of the Asarabacca are chiefly used at the present day as an errhine, or cephalic snuff. The root is very acrid, and when one or two grains are snuffed up the nostrils they cause violent irritation and sneezing, accompanied with a copious flow of mucus, which may continue for several days. The leaves are milder, and are therefore preferred, yet they are sufficiently active to excite the schneiderian membrane, and occasion sneezing with a flow of mucus that may become protracted.

ASARUM CANADENSE.

Wild Ginger, or Canada Snake-root, is occasionally employed as an errhine in cephalalgia, ophthalmia, and in rheumatic and paralytic affections about the head, face, mouth, etc.; also in obstructions, ulcerations, and chronic affections of the various sinuses or surfaces covered by the pituitary membrane. The powdered root is most efficient, but the leaves are likewise employed.

VERATRUM ALBUM.

The finely pulverized Veratrum acts as a violent errhine; indeed, its qualities are so acrid, and its action so severe, that its admixture with some mild powder, as licorice, starch, or flour, is indispensable to its use. In cephalalgia, nasal obstructions, amaurosis, and certain encephalic affections, Veratrum has been used with a view to excite the secretory action of the schneiderian membrane. It is but seldom used.

Veratrum Viride possesses similar properties, and may be used for the same purpose.

TABACUM.

Tobacco when converted into snuff, and taken into the nostrils, acts on those unaccustomed to its use as an excitant to the nasal mucous membrane, causing an increased flow of mucus and not unfrequently sneezing. It is employed as an errhine in chronic catarrhal affections, obstructions of the various sinuses, neuralgic and rheumatic affections about the head, etc.

EUPHORBIUM.

The concrete, resinous juice of one species of the Euphorbia (species not determined), is sometimes employed as a sternutatory and errhine. It causes violent sneezing and a discharge of bloody mucus from the nostrils, with much suffering to the patient. From the violence of its action it is necessary to largely dilute it with some mild powder, as wheat-flour, starch, Licorice, Asclepias, or some other substance. When thus diluted it may be used as an errhine in amaurosis, deafness and other affections of the head.

IRIS FLORENTINA.

Florentine Orris is occasionally employed as an errhine in chronic catarrhs, headache, paralytic and rheumatic affections of the head, etc. It is sometimes masticated to conceal an offensive breath, owing to its pleasant odor; or used as a dentifrice, associated with Gum Myrrh, Cinchona and other articles for the same purpose.

Iris Versicolor, or Blue Flag, is employed, though rarely, as an errhine. It is more acrid and less pleasant to the smell, and is but little used for that purpose.

PHYTOLACCA.

The root of the Phytolacca Decandra, or Poke-root, is likewise employed as an errhine in cephalalgia, catarrhal affections, rheumatic and paralytic disorders, also in cases of polypi. In the [illegible] it is united with the Sanguinaria and em- [illegible]. For ordinary use the powdered root should be diluted with some mild and less irritating agent. It acts violently as an errhine and sternutatory, and to some individuals, it proves quite poisonous when inhaled, even in small quantities.

APOCYNUM.

The Indian Hemp is occasionally (though but seldom) employed as an errhine in the various cephalic disorders already named under the preceding agents. It may be used in cases of headache, in conjunction with Orris, Licorice, Cinnamon, Bayberry, etc.; also in cases of nasal obstructions, chronic catarrhal affections, chronic ophthalmia, etc.

DIVISION XIII.

CLASS XXIII.

ANTACIDS.

Antacids are those agents which correct acidity, in whatever part of the system found, whether in the stomach, intestinal canal, blood or urine. Their action is essentially chemical, as they combine with acids in the system, forming neutral salts, the same as they would if brought together in the chemist's laboratory. They have, however, a secondary action; they not only neutralize the acid, checking its morbid action at the point where it is generated, but by removing this they may remove the cause of a disease at another and different part of the system. As an example of this, we might refer to the severe frontal headache, caused by acidity of the stomach, which is removed by the exhibition of antacids; while at the same time they remove the local irritation and pain of the stomach, caused by the presence of an excessive quantity of acid.

Antacids are principally employed to remove acidity of the stomach; and an important question in the consideration of their action and uses, is the condition of this viscus, that would give rise to an excessive generation of acid. In the normal condition of the stomach when it is empty, it has been shown by Dr. Beaumont, that the fluid which moistens its surface is slightly alkaline or neutral. The gastric juice, nature's solvent for aliment taken into the stomach, is acid; and this acid, whether it be *muriatic* or *lactic*, or both, is an essential constituent of it. But this acid leaves the stomach with [illegible] chyme, and is neutralized in the small intestine by the secretion of the pancreas, the liver and the intestine; the stomach being freed from acid when digestion is completed. "It is right, then," says Dr. Budd, "that while the stomach is empty of food, it should contain no free acid; and that the acid which is requisite for digestion, and which is secreted by the glands of the stomach on the contact of food should, after performing its office, pass into the duodenum, and in its course through the intestine, be either directly absorbed or be neutralized by the alkaline fluids with which it is then mixed. But in various derangements of the stomach the gastric acid is often secreted at unseasonable times, or in too great abundance; or other acids are formed in considerable quantity from the food, and the contents of the stomach are in consequence unduly acid."

A superabundance of acid in the stomach may be caused in three ways: 1. By secretion from the glands of the stomach; 2. It may be taken in the food; 3. It may be generated by decomposition or fermentation of the food in the stomach.

1. We have already seen that the stomach in its normal condition only secretes acid for the process of digestion, and that this acid is removed from the stomach with the chyme; none being left or secreted when the stomach is empty. What then will cause an untimely or excessive secretion of this acid? It has been found by experiment, that irritation of the stomach will cause an increased secretion of this acid at any time—Dr. Beaumont and Spallanzoni having collected it for their experiments by mechanical irritation of the mucous membrane. This, then, would account for its secretion, in irritation or chronic inflammation of the stomach (dyspepsia), simple ulceration, etc. A source of irritation in some other organ that can affect the stomach by a reflex nervous influence, according to Dr. Budd, will also cause an excess of secretion like direct irritation, as is often manifested in the gastric irritation during the passage of gall stones, in organic diseases of the brain, in tubercular disease of the lungs, and various other affections. The same author states, that "Excessive secretion of gastric acid may result from some fault, either inherited or acquired, in what have been termed the secondary assimilating processes, leading to

certain unhealthy conditions of the blood. This is seen most distinctly in gouty persons, and in men of middle age, who have led the life that disposes to gout. The excessive acidity of the stomach, to which such persons are prone, eems to result, for the most part, from an excessive secretion of gastric acid."

In each of these cases there may be an excess of acid in the system, and this is probably the case where it depends upon a fault in the secondary assimilating processes, resulting in an unhealthy condition of the blood. But where the excessive acidity of the stomach is caused by some irritation of that viscus, the acid of the system may be so monopolized that there is not sufficient to maintain the normal acidity of the urine, showing conclusively that it is deficient in the blood. In the first case, an alkali not only acts as an antacid, neutralizing the free acid in the stomach, and allaying the irritation produced by it; but, being absorbed into the blood, it acts as a restorative, lessening the abnormal acidity of this fluid. In the second case, although an alkali will neutralize the acid in the stomach, and thus give temporary relief, yet, as there is not a superabundance of acid in the system, it will eventually prove a positive injury, by rendering the blood and urine excessively alkaline.

2. In persons of feeble digestive powers, acids, as we have already noticed, are formed from the food by a process of fermentation. This does not occur when the stomach is in a healthy condition; the healthy gastric juice being in sufficient quantity for digestion, prevents fermentation, and the generation of acid. "But if the gastric juice be unhealthy, or be secreted too sparingly, or if, from obstruction of the pylorus or otherwise, the food be too long detained in the stomach, it often happens that digestion is disordered, and that there is set up in the stomach some fermentative process by which great quantities of acid are generated. This is especially the case, as Lehmann has asserted, in catarrhal states of the stomach, when, while the solvent juice is poured out sparingly, an unhealthy mucus is secreted, which rapidly decomposes and acts as a ferment for the food." Organic disease of the stomach may give rise to all these conditions, or they may arise from simple debility of

this viscus. The generation of acid from the fermentation of the food (which may generally be diagnosed when digestion is imperfectly and slowly performed), is not by any means a pathognomonic symptom of the condition of the stomach, and other symptoms will have to be considered in forming a diagnosis.

Other diseases frequently result from this fermentation and generation of acid in the stomach, such as colic, diarrhea, sick headache, etc. These are frequently relieved by the administration of antacids, as well as the *heartburn*, or pain in the stomach. Yet we must consider them only as palliative remedies, relieving the present disagreeable symptoms; while to effect a permanent cure, such remedies will have to be employed as give tone and strength to the digestive organs, thus removing the cause of the disease, or as we might more appropriately term it, *morbid symptom*.

"An excessive formation of lactic acid in the stomach," says Dr. Budd, "may lead to impurity of the blood in various ways. The derangement of digestion that attends the excessive formation of acid, may give rise to the formation of other hurtful matters in the stomach itself, and also during the subsequent passage of the vitiated products of digestion through the bowels; and these hurtful matters and part of the uncombined acid may be directly absorbed by the bloodvessels; or possibly, as Dr. Prout suggested, they may be absorbed by the lacteals, and cause additional impurity of the blood by preventing the proper completion of the chyle. Again, as I have just stated, excessive acidity of the stomach frequently causes or co-exists with defective action of the liver, kidneys and skin; and defective action of these important excreting organs may obviously lead to further contamination of the blood. Knowing, then, that an excessive formation of acid in the stomach may lead to impurity of the blood in so many ways, we can hardly wonder at the general or remote disorders which this condition sometimes induces."

In many diseases we have an evidence of an increased acidity of the blood, in the sour smell of the pers
and the breath, the increased acidity of the urine.
sour smelling and green alvine evacuations. Ir

antacids prove curative by neutralizing free acid, whether in the stomach or the blood.

In *fevers* we frequently meet with this condition, the acid character of the excretions being very apparent to the smell. This is particularly apt to be the case in the fevers of children. Here a prominent indication is the removal of the acidity, and the agents which accomplish this do more: by being absorbed into the blood, and excreted by the kidneys, they modify the character of the morbid matter in this fluid, and stimulate the urinary organs to eliminate it from the system. Alkalies, as has been stated (see *diuretics*), are among our most important agents in the treatment of fevers and inflammations.

Rheumatism, according to the present generally received opinion, is caused by an excess of acid in the system. Alkalies have been found to be among the most successful agents in the treatment of this disease.

They have been employed in *diabetes* as auxiliary agents, as it is said, with much benefit; the sour as well as saccharine smell in this disease would indicate their employment.

They are of much importance in the *lithic* or *uric acid* diathesis, as they counteract the generation of this acid, or if it does exist in the blood, it is neutralized there by the alkali.

CALX.

Therapeutic Action.—Caustic Lime, or Quick Lime, is a very powerful escharotic, and as such has been used, though though not extensively. It is an energetic caustic, and has been applied (though seldom) as a moxa, the quick lime being placed in a tube open at both ends, and one end confined to the part where the eschar is to be made, while the lime is moistened with water, which causes a speedy disorganization of the parts.

It is considered resolvent, having been fou [illegible] o soften glandular enlargements It counteracts the for [illegible], and after being absorbed it promotes diu [illegible] s other secretions.

It is a valuable disinfectant thrown into vaults, sinks, damp cellars, etc., for the purpose of destroying or neutralizing the miasmatic effluvia which frequently arises from such situations.

AQUA CALCIS.

THERAPEUTIC ACTION.—Lime-water is antacid, desiccant, anthelmintic, and resolvent. It is a valuable remedy in those forms of dyspepsia attended with acidity of the stomach, sour eructations, and vomiting or spitting of food. For this purpose one part of the aqua calcis may be mingled with two or three parts of milk. This mode of employment is found very salutary in alleviating the nausea and vomiting, as well as in giving tone to the stomach and allaying all the unpleasant symptoms. In many cases of this kind we have employed it with evidences of unequivocal advantage.

Gouty and rheumatic affections, with a tendency to the formation of uric acid, point to lime-water as a suitable medicine to counteract its generation, and destroy it when it exists. For the same reasons it may be employed to counteract the formation of calculous concretions in the urinary organs.

In diarrhœa and chronic dysentery, when the mucous discharge is great, it is useful. In those cases attended with a relaxed state of the intestinal exhalants, its tonic, antacid, and desiccant properties render it an appropriate remedy. It is considered astringent by some, still it does not corrugate the muscular fiber to which it is applied as that class of agents does; it seems, however, to dry up or greatly diminish intestinal exhalation, and thus proves valuable in these cases. It has also been used to check excessive bronchial secretion, secretion from the bladder, etc.

CRETA PRÆPARATA.

The Prepared Chalk is an important antacid, and as such is very frequently employed to neutralize the acid generated in the primæ viæ.

It is extensively used in the bowel complaints of children arising from the existence of acid in the alimentary canal. It unites with the free acids in the stomach (acetic and hydrochloric), forming salts (acetate of lime and chloride of calcium) which are not purgative, but readily absorbed into the circulation, when their effect seems to be to lessen the secretions. Although it is not astringent, yet it seems to exert an indirect influence of this kind upon the bowels, probably in part by destroying the acid, thus lessening the irritating character of the alimentary contents. It also seems to act as a desiccant, for it often lessens the alvine evacuations when acid can not be supposed to be present. Not only so, it seems to exert an influence in diarrhœa not witnessed when other agents of an alkaline character are prescribed.

MAGNESIA CALCINATA.

Dose.—As an antacid for a child, grs. ij. to grs. x.; for for an adult, grs. x. to ʒss.; as a laxative for a child, grs. v. to x; as a laxative for an adult, ℈j. to ʒj. It may be given in milk or sweetened water.

Therapeutic Action.—The Calcined Magnesia, already fully described as a medicine under the class of Laxatives, is a very important antacid.

In diarrhœa and dysentery, and in the summer complaints of children, arising from the presence of acid in the primæ viæ, it is highly useful. It not only unites with the acid, but seems to dry up the secretions, or in other words, to act as a desiccant. It is also useful in lithiasis, attended with an excessive secretion of uric acid.

If administered in large doses it acts as a laxative, the magnesian salts formed by the union of the Magnesia with the free acids of the stomach being purgative.

It is useful in cardialgia, acid eructations, acid dyspepsia, and in the nausea, vomiting, heartburn, acidity of the stomach, etc., attending pregnancy. It is also employed as an antidote to neutralize the mineral and other acids when introduced into the stomach. In gouty and rheumatic habits it is often beneficial. It is used as a laxative in diarrhœa and dysentery; often combined with aromatics and rhubarb.

MAGNESIA CARBONAS.

Dose.—As a laxative, grs. x. to ʒj.; as an antacid, from grs. v. to ℈j.

The Carbonate of Magnesia, previously described under the class of Laxatives, is very similar to the calcined in its properties and effects upon the system.

In the case of poisoning by the use of mineral acids, and in cases of cardialgia, when the object is to neutralize the acid in the stomach, the calcined magnesia is preferable, for the reason that it does not effervesce with the acids, consequently does not cause flatulency. It is, however, prescribed in acidity of the bowels, cardialgia, in cases of excess of uric acid, etc.

The reader is also referred to this agent under the class of Laxatives for a detailed account of its properties.

LIQUOR POTASSÆ

Dose.—From ten drops to half a drachm, largely diluted with some mucilaginous fluid, an infusion of orange-peel, or some of the vegetable bitters.

Therapeutic Action.—The Aqua Potassæ is antacid, antilithic, diuretic, alterative, and if applied to the surface in a concentrated form, it is an active caustic; if suitably diluted, it acts as a local stimulant.

This liquid is but rarely used at the present day, other, milder and more acceptable preparations of potash being substituted for it.

It has been used as an antacid and antilithic in some cases with great success. It can not, however, be regarded as a lithontriptic, as it at one time was, but rather as a useful agent for counteracting that condition of the system which results in a redundant secretion of uric acid, and in the formation of urinary calculi. It is sometimes used with success in enlargements and indurations of the lymphatic glands, occurring in scrofulous and syphilitic habits, and in some other diseases, in conjunction with the compound decoction of Sarsaparilla.

POTASSÆ CABBONAS.

Dose.—From one to ten grains in solution.

The Carbonate of Potash is occasionally resorted to in cases of indigestion, attended with [illegible]dity of the stomach. Notwithstanding this salt is us[illegible] bicarbonate of the same [illegible]

It is likewise resorted to, though rarely, as an antilithic. In those cases of gravel attended with a red deposition in the urine, it proves beneficial. It is less acceptable to the stomach than the bicarbonate, and hence is less frequently used.

BICARBONATE OF POTASSA.

DOSE.—From two to twenty grains.

The medical properties of this salt are similar to those of the carbonate of the same alkali. The additional equivalent of carbonic acid renders its local action much less energetic, and hence it is not adapted to the formation of eschars and as an application to ulcers when caustics are indicated.

From this cause it is decidedly preferable to the carbonate in consequence of its greater acceptability to the stomach and the mildness of its taste. It is an important antacid in cases of lithiasis, and other cases requiring the use of such agents. It is superior to the alkalies derived from the soda, in consequence of the urates of potash formed in the urine being decidedly more soluble than those of soda. It is not unfrequently employed to modify the quality of the urine in cases of redundancy of the uric acid in that fluid, and in disordered states of the urinary organs arising from that cause. It is also used in cases of glandular enlargements with success. In cases of acid indigestion it is probably unequaled by any other antacid. In cases of cardialgia it will often give prompt relief, and effectually eradicate the tendency to the generation of acid in the stomach, especially when administered in conjunction with some of the bitter infusions.

A frequent and important use made of this article is in the form of effervescing draughts, in cases of nausea and vomiting arising from an irritability of the stomach. For this purpose it may be united with the citric acid, tartaric acid, lemon juice, or the dilute sulphuric acid.

Grs. xx. Bicarbonate Potash. { Crystals of Citric Acid, grs. xiv.; or
Crystals of Tartaric Acid, grs. xv.; or
Lemon Juice, ʒij. to ʒiij.

Mix either of the acids in cold water, and sweeten with loaf- [illegible] some syrup, as lemon, and then dissolve the potash [illegible] portion of water and add the liquids together, and when in a state of effervescence drink it. This draught promotes the secretion of urine and perspiration.

SODÆ CARBONAS.

Dose.—From two to ten grains, in solution.

The medical properties of the Carbonate of Soda are very similar to those of the Carbonate of Potash. It is less acrid and less unpleasant to the taste than the Potash, but the effects of the two salts upon the system are very analogous. The Carbonate of Soda is generally preferred as an antacid and antilithic to the potash, being less unpleasant. It is mostly employed in cases of acidity of the stomach, and in those forms of lithiasis attended with an excessive secretion of uric acid.

SODÆ BICARBONAS.

Dose.—From five to twenty grains, in solution.

This salt is less caustic than the carbonate of soda, and less unpleasant to the taste, but in other respects its properties and effects upon the system are analogous to those of the other caustic alkalies.

It is employed in dyspepsia, attended with a redundency of acid in the stomach, as an antacid; also in cases of lithiasis, accompanied with an excessive secretion of uric acid. It is also resorted to occasionally as an alterative and resolvent in scrofula, glandular enlargements, syphilis, and as a diuretic in hydropic cases, especially in those resulting from glandular diseases. It has been resorted to with advantage in infantile croup, to facilitate the expectoration of the pseudo-membranous formation in the trachea, in doses of one grain every five minutes.

It is frequently employed in the form of the effervescing draught, seidlitz or soda powders, etc. They allay thirst, fever, nausea, and vomiting, and prove highly refreshing to the patient. They are also useful as lithontriptics and diuretics, but should be employed in the lithic or uric acid diathesis.

LIQUOR AMMONIA.

Dose.—From five to thirty drops, largely diluted with water, or some demulcent drinks.

In those forms of dyspepsia attended with preternatural acidity of the stomach and flatulence, it often exerts a highly sanative influence upon the system. In such cases it is not only administered with a view to neutralizing the free acid in the stomach, but also as an excitant to the digestive organs. It is useful in sick headache when dependent upon acidity of the stomach, likewise in heartburn produced by the same cause.

In cases of poisoning from mineral acids, ammonia might be used, largely diluted, with a view of neutralizing the acid. It is particularly recommended in cases of poisoning by the prussic acid. It is appropriate when the oil of bitter almonds has been taken.

In cases of poisoning by acids, it is taken internally, and if prussic acid be the poison, it may be cautiously inhaled.

Antidotes.—Juice of the lemon, orange, vinegar, etc.

AMMONIA CARBONAS.

DOSE.—From five to ten grains.

In this place we shall simply speak of the Carbonate of Ammonia as an antacid. Though less frequently used for that purpose than to fulfill sundry other indications which are referred to under another head, still it proves valuable as an antacid.

It is sometimes employed in cases of acidity of the stomach, being similar to the aqua ammonia in its properties and effects upon the system. Its local action is less energetic than that of the liquor ammonia; the carbonic acid with which it is combined serving to diminish the intensity of its local effects, and render it much milder.

The ammonia is employed in gouty affections, particularly those of an atonic character, and likewise in acidity and derangements of the stomach dependent upon habits of debauchery. It is less frequently used, however, than the antacids to which reference has already been made.

It is frequently employed in the preparation of the effervescing draught.

Carbonate of Ammonia, grs. xx.	Lemon Juice, ʒvj.; or Crystalized Citric Acid, grs. xxiv.; or Crystalized Tartaric Acid, grs. xxv.

CLASS XXIV.

ANTILITHICS.

ANTILITHICS are agents which counteract the predisposition to the formation of calculous concretions in the urinary organs.

The urine, when it is strictly healthy, instead of being a simple homogenous fluid, is one of the most heterogenous character. It is a chemico-vital fluid, holding various substances in definite proportions in a state of solution.

Changes in its composition are constantly occurring, or liable to occur. A redundancy or a deficiency in any of the healthy constituents of that fluid is to be regarded as a state of disease. If they are augmented beyond the standard of health, that fluid is not capable of holding them in a state of solution, and they are liable to be deposited, if not thrown off, in the form of a urinary sediment, which, by further accretion, may result in the formation of urinary calculi.

The general habit of body which tends to the formation of urinary sediments, is termed the *calculous diathesis.* No inquiries relative to the changes which are taking place in the system, can be more interesting to the pathologist than those which pertain to the investigation of the causes of the calculous diathesis, the modifications of health, the changes which take place in the urine, and the elements which it holds in solution in a state of health, and the depositions which often follow any transition from a healthy to an unhealthy state.

The most trivial disease of the genito-urinary organs often awakens the most lively apprehensions of the patient, and this is especially the case when calculi are supposed to be formed and to exist in the kidneys or bladder. The serious operation resorted to for its removal, together with all the suffering (which is by no means trifling), renders it a disease doubly alarming to the patient, as well as formidable to the physician.

Agreeably to chemistry, these urinary depositions vary as to composition in different individuals, or even in the same individual at different times, arising from modifications of health, diet, drinks, exercise, etc.

All the various urinary compounds, says Prout, are composed of the four following elementary substances: 1. The lithic acid and its compounds; 2. The oxalate of lime; 3. The cystic oxyd; 4. The earthy phosphates.

The same author remarks, relative to the forms in which urinary deposits occur, that though all are composed of the same ingredients, yet they may be "divided into three classes, viz.: 1. Pulverulent or amorphous sediments; 2. Crystalline sediments, usually denominated gravel; and, 3. Solid concretions, or calculi formed by the aggregation of these latter sediments."

The chemical history of the crystalline sediments or gravel and the solid concretions or calculi, can alone point to the true indications of cure.

The calculous diathesis in some cases seems to be hereditary, when it is extremely difficult to eradicate, and may be irremediable; diet and regimen, aided by suitable chemical antilithics and corroborants, may, however, accomplish much.

The two principal diatheses are the *lithic* or *uric acid diathesis* and the *phosphatic.*

Most of the *amorphous* and *pulverulent* sediments consist of lithic acid and its compounds. Agreeably to the data of Dr. Prout, two-thirds of the whole number of urinary calculi are connected with or arise from the predominance of this diathesis. The lithic deposit often forms the nucleus around which or to which other deposits become attached, and thus calculous concretions are formed.

"The yellowish, or nut brown, reddish brown or lateritious, or pink sediments," characterize the *lithic acid diathesis.*

The white or gray precipitates constitute the earthy phosphates and characterize the *phosphatic diathesis.*

"What the essential characters of these diatheses are," says Dr. Eberle, "it would be in vain to inquire."

It appears evident, however, that the *lithic acid* diathesis arises from the generation of acid as in *acid indigestion*. Whatever tends to enfeeble the digestive organs is particularly calculated to favor the production of this diathesis. "It appears, moreover," says Dr. Paris, "that whatever tends to disturb the process of digestion, by favoring the production of acid, may be considered as the exciting cause of lithic deposits, especially when the cutaneous functions are imperfectly performed." Those who use vegetable diet mostly, seem to be most frequently the subjects of this diathesis. Dr. Wilson Philip remarks, that acid and acescent ingesta tend to increase the deposition of lithic acid from the urine and to prevent that of the phosphates. The production of perspiration prevents the lithic deposit and promotes the phosphatic deposits. Dyspepsia favors the lithic while it lessens the phosphatic diathesis by producing acidity in the primæ viæ and rendering the skin less active. Indolence diminishes the activity of the digestive organs, and the activity of cutaneous transpiration, which favors the lithic acid diathesis by diminishing the amount of acid which should pass off through the cutaneous emunctories. It would seem that the lithic acid diathesis is intimately connected with the arthritic habit. It has been frequently remarked that the children of gouty parents have some of them been the subjects of gouty attacks, while others have been the subjects of calculous affections. This view is further corroborated by the concretions of the urate of soda met with in the joints of those who have been the subjects of repeated arthritic attacks: also from the derangements of the stomach and bowels.

From the foregoing remarks it is evident that there is a redundancy of acid generated in the system, arising in part at least from an enfeebled state of the digestive apparatus and from the fermentation and generation of acid which takes place from the use of large portions of indigestible vegetable food, the use of acids, etc., with a deficient action of the perspiratory vessels; for when they are active or when the insensible perspiration goes on freely, the lithic acid is carried off by the skin and its deposition in the urine ceases, or is diminished, the preponderance of acid in the circulation and urinary secretion is counteracted. This diathesis is indicated by the high color of the urine, and by the red, yellow, lateritious or pink-colored sediment deposited in the urine, resembling brick-dust; it being the crystals of lithic acid or lithate of ammonia. The urine in this case reddens litmus paper, showing that it is decidedly acid.

From what has been said relative to the exciting and proximate causes of this form of lithiasis, the treatment both medical and dietetic must be evident. If this variety of calculi be present, or if this diathesis exist, alkalies are of primary importance. They unite chemically with the acid in the primæ viæ and neutralize it; they are also absorbed and destroy the acid in the circulating fluids, and in the secretions, particularly the renal secretion, and thus prevent the deposition of the crystals of lithic acid, and if it exists in the urine, this being medicated, destroys it or prevents calculous concretions.

In connection with the foregoing agents, tonics to improve the functions of the stomach, mild diaphoretics to augment the insensible perspiration, and the alkaline bath will be found advantageous. Especial attention should be paid to the diet; mild, nutritious and digestible diet, with an increase of animal food, should be taken, not in excess, but in sufficient quantity to sustain the vigor of the system. All excesses should be carefully avoided. Moderate exercise, change of diet, air, exercise, scenery, society, etc., and every thing calculated to invigorate the physical and nervous powers will be calculated to counteract the tendency to the formation of lithic deposits.

By strengthening the digestive organs we render the chyle healthy, and prevent the undue formation in the chylopoiëtic organs of those materials, from which the urinary deposits are formed in the kidneys. The alkalies pass through the circulation, are separated by the kidneys, and "exert a solvent influence upon the lithic concretion, existing in the kidneys and bladder." The capacity of any agents now known to dissolve these concretions when fully formed into gravel or calculi, is, to say the least about it, problematical. They should be viewed as palliatives, or at best as preventives of this diathesis, and not as curative agents.

Phosphatic Diathesis.—This diathesis is exceedingly important in a therapeutic, as well as pathological point of view. The phosphoric acid and its numerous compounds in the form of urinary calculi, are truly formidable. "It is," says Paris, "to the abundance of its compounds that we are to look for mischief." In this form of lithiasis the color of the urine and the character of the deposits differ materially from those of the former habit. In this diathesis the urine is pale, and contains *white gravel* or precipitate of the earthy phosphates.

The crystals are pale brown, gray or white, and composed of the phosphoric acid, united with magnesia, ammonia or lime, mostly the latter; constituting the phosphates of magnesia, ammonia or lime respectively. In the formation of these calculous concretions, the alkaline principle preponderates.

In the phosphatic diathesis the symptoms are decidedly cachectic. The general habit is morbid or depraved—prostration of the whole system—debility and irritability of the nervous system in particular—lack of innervation—the nutritive and assimilating functions are impaired—in some cases the bladder loses its muscular power, arising from disease of the prostate gland, or injuries or diseases of the spine. Says Eberle, "The circumstances which appear to favor the formation of phosphatic diathesis are injuries done to the back, and whatever produces a nervous state of the system, as fear and mental anxiety, and also the long use of alkaline remedies."

Dr. Prout, after remarking that deposition of the earthy phosphates from the urine was attended by very distressing symptoms, says, "They consist in great irritability of the system, and derangement of the chylopoiëtic viscera in general, such as flatulence and nausea, obstinate costiveness, or peculiarly debilitating diarrhea, or both, frequently alternating; and the stools are extremely unnatural, being either black or clay-colored, or sometimes like yeast." He further observes there is pain, weakness and uneasiness in the back and loins, a sallow, haggard countenance, and symptoms analogous to those of diabetes.

This diathesis is most frequently met with during the middle or advanced periods of life, and after the process of ossification is completed.

"The urine of infants and nurses contain very little phosphate of lime and phosphoric acid; it is not until after ossification is finished that these elements are found in abundance in the urinary fluid. That of old men on the contrary, contains a great quantity of them; the bony system, already overcharged with the phosphate of lime, refuses to admit more of it. This saline substance would ossify every part, as it does sometimes in the arteries, ligaments, cartilages and membranes, if the urine were not to remove the greater part of this superabundant portion. In rachitis it is by the urine that the phosphate of lime passes off; the absence of which causes the softness of bones."

The medication in this form of lithiasis is very evident. The redundancy of the alkaline deposits or earthy phosphates, points unequivocally to the employment of acids, especially the mineral acids, as chemicals agents, to counteract this diathesis. In connection with acids, corroborants and alteratives to restore the tone of the general system, improve digestion, give energy to the nutritive and assimilating functions, and to give increased innervation, and thus counteract the deranged state of the chylopoiëtic viscera, and depraved or cachectic habit of body met with in this diathesis. The nitro-muriatic acid bath may be resorted to with a prospect of much advantage. The diet should be mostly vegetable, easily digestible, taken freely, but not in excess. Change of scenery, air, society, moderate exercise, regular habits,—in short, every measure calculated to improve and elevate the mental and nervous powers, as well as physical stamina,—are demanded.

It is proper in this place to remark that these diatheses not unfrequently alternate—the lithic may be converted pontaneously, or by the free and protracted use of alkaline medicines into the phosphatic; while the latter, by the use of certain dietetic measures, or by the use of acids, may be converted into the former. These changes are by no means unimportant, either in a pathological or therapeutic point of view. The conversion of one diathesis into another, as is often evinced by the change of urinary deposits from the use of medicine, has frequently caused the ignorant pretender to imagine that his agents were solvents of the stone or lithontriptics, and effecting cures by dissolving the calculi already supposed to be formed, and lodged in the kidneys or bladder; and as an evidence of the truth of his views he points exultingly to the deposits which have changed in character and greatly increased in quantity under the use of his medicine. This fact alone is often an evidence of his ignorance. He has given acids when alkalies should have been used, or used alkalies when acids would have been proper, or prescribed improper diet, and thus converted the deposits into those of an opposite character, and by the free use of his medicine has furnished the material of increased deposits. This increased lithic or phosphatic deposit, he supposes, is the calculi or stone which his medicine has crumbled to powder, and is now passing off freely, when in reality it is a change of the diathesis or an aggravation of the one already existing. The pathological character of the disease is now more intractible than before. The judicious physician will closely watch for these changes, and modify his treatment accordingly.

Though the principal forms of lithiasis are two—the *lithic* and *phosphatic*—yet the form, chemical character, gravity, etc., of the different forms of urinary calculi, resulting from their diathesis, are very variable.

1. Lithic or Uric Species of Calculi.	Form, flattened and oval; specific gravity, 1.500; color, reddish brown; surface, smooth, with a laminated texture; chemical composition, lithic acid; mostly soluble in alkalies; common form of calculi—often constitutes the nuclei of other species.
2. Mulberry Calculus.	Color, dark brown; texture, harder or more firm than other species; consists of the oxalate of lime—by heat is converted into quick-lime.
3. Bone Earth. -	Color, gray or pale brown; surface smooth; structure laminated; composed mostly of the phosphate of lime.
4. Triple. - - -	Color, brilliant white; surface uneven; less compact; is termed ammoniacs; magnesia phosphate; mixed with the phosphate of lime, pure alkalies decompose it by extricating its ammonia; attains a large size.
5. Alternating. -	Exhibits different concentric laminæ; compound of different species.

Notwithstanding the general and very plain rules which have been laid down to guide the therapeutist in the administration of acids and alkalies as already indicated in the diathesis referred to, yet when they do exist until calculous concretions are formed, and when these concretions are laminated and of a compound character, the same measures may be resorted to to destroy the diatheses and prevent the further accretion to the nucleus already formed. In cases of the compound calculi, the use of acids and alkalies alternately will prove beneficial, or act as solvents—or as lithontriptics, some therapeutists suppose—by medicating the urine, which, if acid, will destroy the lamina composed of the earthy phosphates, and vice versa when the alkalies are used and the lithic concretes are exposed to the medicated alkaline fluid. "In the alternating calculi it may be judicious to exhibit these remedies alternately, as the symptoms of the case and the deposit of the urine may indicate." In this way these agents frequently corrode the calculi, render them rough and irritating to the urinary organs, which is often the cause of great irritation and suffering to the patient. In this way a disadvantage instead of an advantage, may result from these reputed chemical lithontriptics.

With regard to the causes which give rise to these diatheses, they are various and obscure. They seem, however, to be dependent upon some morbid condition of the stomach and chylopoiëtic organs. A dyspeptic state of the stomach seems to favor these habits, but particularly that of the lithic character. A morbid state of the digestive apparatus undoubtedly strongly predisposes to lithiasis. It is not improbable that the digestive organs form the materials, while the kidneys separate them from the blood. A morbid condition of the renal emunctories may separate that which in a healthy state would not be manifest. It is also very reasonable to suppose the urine, owing to some chemico-vital defect in its properties, is rendered incapable of holding in solution the phosphates and lithates, and hence they become deposited or precipitated in the form of powder, which forms the nucleus of the calculous concretions; these concretions grow by accretions of the respective depositions already named.

LITHONTRIPTICS.

Immediately and very intimately connected with the class of agents termed antilithics, are those called lithontriptics, or solvents of urinary calculi. That we are in possession of any known agents of this character, is highly questionable Some of the acid and alkaline antilithics, as stated unde that class of agents, will gradually destroy the stone, or cause it to dissolve or disintegrate by rendering the urine a chemical solvent. To accomplish this desirable object, recourse is had to the acids and alkalies respectively, to counteract the diathesis, giving rise to the particular calculous concretion, or cause a disintegration of that already existing. These measures, even when they do not cause a disintegration of the calculi, often greatly mitigate the sufferings of the patient. It is probable that these agents act mostly by counteracting those morbid conditions which give rise to calculous concretions, while the chemico-vital influences of the system cause its gradual solution. This view of the subject seems to be satisfactorily proved when the calculi is of the lithic acid character, by bringing the chemical solvents in direct contact with it, by injection, when it is found the bladder will tolerate the presence of an alkaline solution of sufficient solvent power to dissolve it. It would seem, however, from the experiments of Brodie, that the phosphatic and carbonaceous concretions, when imperfectly formed, may be dissolved by injecting a weak solution of nitric acid into the bladder. Unfortunately, says Paris, the irritable state of the bladder will not permit the retention of the proposed menstruum in contact with the calculi for a sufficient length of time to accomplish any material solution; and this mode of medication, at first view so plausible, and so full of promise, often proves unavailing, if not absolutely prejudicial.

Another and very ingenious mode of causing the disintegration of calculi in the bladder is suggested by M. M Prevost and Dumas. It consists in the application of galvanism, by passing a double sound into the bladder, and bringing one end in contact with the calculus, while the other is in contact with two vessels of water, connected together by the opposite poles of a galvanic apparatus. By passing a galvanic current through urinary calculi after being removed from the subject, or through them when placed in the bladder of a dog, the disintegration of the concretion has been effected. The proposition of these gentlemen has not been very favorably received. It is supposed that any decomposing power of this character, introduced into the bladder, might act with too much violence upon that viscus, and consequently would not be altogether devoid of danger. It must be admitted that the suggestion is highly plausible, and liberality forbids that it should be rejected without a fair trial.

After all our speculations upon the solvent power of different agents, it must be admitted that they often, and I may safely say, generally fail to accomplish the desired object; and in many cases, where the urgent symptoms disappear, and the lithontriptic is supposed to have effected a cure, the asperities of the concretion are removed, and it becomes enveloped in a coat of mucus, or imbedded in a cyst, which shields the bladder from its action, and thus obtains for the medicine the erroneous appellation of a true lithontriptic. We confidently look forward to the time, which we hope is not far in the future, when we shall be in possession of infallible agents for the relief of this much to be dreaded affliction.

With our present state of medical knowledge, the department of surgery affords the only certain *lithontriptic*, in the instrument called a lithontriptor, by which the calculus is crumbled to powder in the bladder, when it is readily passed off in voiding the urine.

DIVISION XIV.

CLASS XXV.

DEMULCENTS.

Demulcents are agents administered for the purpose of correcting the action of drastic or irritating medicines upon the mucous membranes, or to allay irritation or inflammation of those surfaces. When given to modify the action of an irritant upon a sensitive surface, they may be combined with it so as to involve the acid itself, or to so cover the mucous surface as to shield it from the effects of the remedy.

Demulcents do not prove valuable as medicines by changing the acrid or corrosive properties of the agents with which they are administered, but simply by involving them in a viscid fluid, or by shielding the parts with which they come in contact.

They are also valuable in cases in which the secretions poured into the primæ viæ become vitiated and irritating to the mucous membrane. They unite with it, dilute it, and thus destroy its irritant properties, besides shielding the mucous surfaces from its action.

Many writers upon therapeutics have very erroneously, as it seems to us, classed demulcents and emollients together, and regarded them as synonymous. It can not be denied that their properties are the same in most cases, but the difference between the two classes consists in their application or mode of employment. While the term *demulcent* is employed to denote internal agents,—those especially adapted to diseases of the mucous membrane,—the term *emollient* is applied to those external agents employed to soften and relax the tissues, allay irritation, inflammation and pain.

These agents, when taken into the stomach, soothe and allay irritation and inflammation, and are found to be very valuable in many diseases. They consist of the various mucilaginous articles, as the ulmus fulva, flax-seed, gum-arabic, etc., and some of the expressed oils, as the olive, almond, etc.

Their properties and mode of action very clearly point to their proper therapeutic employment. In all inflammatory affections of the respiratory apparatus, they are of unquestionable utility, their soothing influence upon the fauces, glottis and trachea, is extended to the entire mucous membrane of the air-passages, by contiguous and continuous sympathy, and the diseases materially modified by their employment. They are also employed in the form of emulsions, sirups, troches, etc., in cases of harrassing cough, with much advantage.

They are very important agents in the treatment of gastro-enteric inflammation. In gastritis, enteritis, diarrhea, etc., they come in direct contact with the parts inflamed, and allay the pain, irritation and exalted organic action, with more certainty than most of the classes of therapeutic agents. It is true, many of these agents, especially those of a mucilaginous character, are digested, which may diminish their beneficial influence to some extent; yet the intimate sympathy existing between every part of the mucous membrane, enables us to account for the sanative and very desirable remedial influence exerted by this class of agents. They may also prove valuable by mingling with the intestinal contents and rendering them less acrid and irritating.

They are, many of them, very nutritious, and very easily digested, and may be taken freely in febrile and inflammatory diseases, where there is extreme debility of the digestive organs, and where it is necessary that the patient should have unirritating and easily digested diet, and where the stronger articles would overpower the enfeebled organs and destroy life.

They are also valuable in calculous affections, and in cases of nephritis, cystitis, or urethritis; but it is difficult to comprehend how they influence the urino-genital mucous membrane, aside from their soothing action upon the other mucous surfaces, and their influence in allaying excitement in the general system. We believe a close sympathy exists between every part of the animal economy; but this is more especially the case between similar tissues and structures, of which the mucous membrane affords the best example.

Some have supposed that the various demulcent agents enter the circulation unchanged, and are carried to the urinary organs and pass off through them, and thus exert a direct influence upon the parts diseased. This supposition, however, has no foundation in fact; for the changes wrought upon all the mucilaginous demulcents by the digestive organs, as already stated, preclude the probability of their exerting a direct influence upon these organs, unless they act as diluents. The large quantities of aqueous fluid generally taken with them renders them diluents; and in this way, by increasing the fluid portions of the urine, they lessen its acrimonious character.

ACACIA.

THE CONCRETE JUICE OF ACACIA VERA—GUM ARABIC.—ASIA.

THERAPEUTIC ACTION.—Gum Arabic is demulcent, nutritious and emollient. It is much employed as a demulcent in inflammatory and catarrhal affections of the mucous surfaces. From its viscidity it serves to shield inflamed and irritated surfaces, and hence its utility in irritation or inflammation of the fauces, larynx, trachea, bronchia, lungs, stomach, bowels, urinary organs, etc. Slowly dissolved in the mouth, it serves to allay cough by diluting the secretions and lessening the irritation going on in the respiratory apparatus. In gastritis and mucous enteritis, it is highly valued. It is particularly serviceable in cases of poisoning by any of the acrid or corrosive agents, by shielding or protecting the mucous surfaces. It is much used associated with harsh or acrid medicines, as drastic cathartics, or irritant diuretics and expectorants, to involve them in a mild viscid medium, and thus lessen or prevent them from doing injury to the mucous membranes and parts upon which they act.

As a pharmaceutical agent, it is extensively used to suspend or diffuse oily, resinous, and other insoluble substances in aqueous fluid, and to give tenacity to pills, troches or lozenges.

A strong solution has been applied to burns—it alleviates pain and sometimes prevents blistering. It may be employed as an emollient in other local inflammations.

ALTHÆA.

Marsh-mallow root is one of our most valuable demulcents, and is especially adapted to the relief of irritation and of inflammation of mucous surfaces. Gastritis, mucous enteritis, nephritis and cystitis, gonorrhœa and bronchitis are among the diseases in which it may be employed with advantage. The powdered root and the decoction are often conjoined with acrid or irritating agents to modify their action and render them more acceptable to the stomach. It forms an excellent demulcent drink in febrile diseases attended with intestinal irritation. The leaves and tops possess the same properties to a less extent.

ALTHÆA ROSEA.

The root, leaves and capsules containing the seeds of the Hollyhock, possess properties similar to the marsh-mallow. They are used for their demulcent and emollient properties in cases of irritation or inflammation of the mucous membranes. It is employed in the form of decoction, either alone or combined with Licorice, and sweetened with loaf-sugar, to which lemon-juice or aromatics may be added to impart to it an agreeable flavor. The roots and leaves are sometimes made into a poultice and applied to painful ulcers and inflamed surfaces, or cloths dipped in the mucilage are applied to burnt, abraded or inflamed parts, and to the eyes in cases of ophthalmia.

MALVA.

The herb and flowers of the Malva Sylvestris, or Common Mallow, abound in a mucilage which they readily impart to water. They are demulcent and emollient, and are exhibited in irritated and inflamed states of the alimentary canal, pulmonary and urinary organs, etc. We have often prescribed a decoction of mallow in dysuria and irritated or painful states of the urinary organs, with decided advantage.

In dysenteric tenesmus the decoction is useful in the form of enemata, and the fresh plant constitutes an excellent relaxing emollient, and suppurative cataplasm, in cases of external inflammation.

TRAGACANTHA.

Tragacanth is demulcent and nutritive, but owing to its difficult solubility and digestibility, it is seldom used for internal purposes.

The powder is sometimes employed as a vehicle for the exhibition of heavy or active agents, but not on account of any specific action which it exerts; and its aqueous solution, being possessed of great viscidity, is also useful for the suspension of heavy or insoluble substances. It is rarely used as a simple demulcent or sheathing agent in irritation or inflammation of the mucous surfaces, as it is not so digestible as gum arabic and most other demulcents, and possesses no advantages over them in other respects. In pharmacy, however, it is used to give consistence to troches, for which it is preferred to gum arabic.

AMYGDALA.

The fruit of the two varieties of the Amygdalus (Bitter and Sweet Almond) possesses demulcent and emollient properties.

The kernels of the Amygdala Dulcis, or Sweet Almond, are mostly used for their demulcent and nutritive properties. An emulsion, prepared by triturating the blanched almonds with water and loaf sugar, constitutes a pleasant vehicle for the exhibition of other medicines, and a useful preparation in coughs, chronic catarrh, and inflamed states of mucous surfaces generally.

Oleum Amygdala.—The oil obtained by expression from the kernels of either the bitter or sweet almonds, possesses demulcent, emollient, nutritive, laxative and pectoral properties, and may be used in all cases of irritation or inflammation of mucous surfaces, whether the result of disease, or caused by acrid or irritant medicines.

SESAMUM.

The leaves of the Benne Plant afford a gummy substance which is readily extracted by water, forming a bland mucilage which is much employed in the Southern States, in various diseases of the mucous membranes in which demulcents are demanded, such as diarrhœa, dysentery, cholera infantum, irritation or inflammation of the respiratory passages, urinary organs, etc. This rich, bland mucilage may also be taken with much freedom in febrile and inflammatory states of the system not attended with any special irritation of the mucous surfaces. One or two fresh leaves to half a pint of cold water, or the same quantity of dried leaves introduced into a similar amount of hot water, if stirred about for a short time, afford a mucilage of proper consistence. Lemon-juice adds much to its flavor.

CYDONIA.

Quince Seeds abound in mucilage, which is demulcent and nutritive. It may be employed in irritation or inflammation of the respiratory, intestinal and urinary mucous membranes, like other demulcent remedies.

The decoction is employed as an emollient to cracked lips, sore nipples, inflamed eyes, painful hemorrhoidal tumors, erysipelatous inflammation, burns, scalds, etc.

ULMUS.

The bark of Slippery Elm is one of our most valuable medicinal agents, on account of its highly demulcent and emollient character. As a demulcent it is applicable to all cases in which mucilaginous remedies are indicated. It is especially appropriate in diseases of the mucous membranes, such as diarrhœa, dysentery, and affections of the urinary organs; also in coughs and irritation of the repiratory passages. It is one of the best agents to which we can resort in gastritis, whether induced by acrid or irritating substances taken into the stomach, or the result of general causes. It is also of much service in inflammation of the fauces, larynx, and trachea, and in apthæ. It constitutes an excellent drink in the febrile and phlegmasial diseases, especially if any tendency to intestinal irritation exists.

TUSSILAGO.

Colt's Foot is demulcent, tonic, expectorant and pectoral. It is chiefly used on account of its demulcent and pectoral properties. It was formerly much esteemed in coughs, colds, phthisis, and other lung affections. It is made into a decoction, an ounce and a half being added to a pint of water.

GLYCYRRHIZA.

Licorice-root is highly esteemed as a demulcent and expectorant in bronchial affections, bowel complaints, and diseases of the urinary organs.

Indeed its mild demulcent qualities render it very useful in acute inflammatory affections of mucous membranes, particularly those of the respiratory organs. It is much used to give flavor to other medicines and modify their action, especially the acrid stimulating expectorants, the Squill, Sanguinaria, Senega, etc.

CHONDRUS.

Irish Moss possesses demulcent, expectorant and nutritive properties. Owing to this combination of therapeutic virtues it is valued in both acute and chronic bronchitis, phthisis, and other disorders of the lungs; also in gastritis, mucous enteritis and diseases of the mucous membrane of the alimentary canal, attended with irritation. It is of service occasionally in dyspepsia, and has been named in scrofula, rachitis, enlarged mesenteric glands, etc.; also in acute diseases of the urinary organs. It is usually employed in the form of decoction or jelly.

CETRARIA.

Iceland Moss is mostly employed as a therapeutic agent, on account of its demulcent and nutritive qualities.

It is much esteemed in the inflammatory diseases of mucous surfaces, especially those of the respiratory organs. It abounds in mucilage, which renders it of much service in catarrhal affections, both acute and chronic, also in phthisis and other forms of lung diseases, attended with a redundant purulent expectoration.

It is mostly administered in the form of decoction, half an ounce of the Moss being added to one pint and a half of water and boiled down to one pint and forcibly strained.

LINUM.

Flaxseed is often used as an internal agent, owing to its demulcent properties. It also possesses nutritive and expectorant qualities. The diseases in which it is mostly administered are those affecting the mucous passages of the respiratory organs, such as laryngeal and bronchial inflammation.

It is also used in gastritis, dysentery and acute disorders of the urinary organs. The mucilage in which the seeds abound is of much service in allaying troublesome cough and diminishing any irritative or inflammatory action that may exist in any of the mucous tissues. It is employed in the form of infusion.

SYMPHITUM.

Comfrey is mostly used as a demulcent in diseases of the gastro-intestinal and pulmonary mucous membranes. In cases of irritation or inflammation of those tissues, whether acute or chronic, also in diseases affecting the genito-urinary organs, its free exhibition is often followed by very satisfactory results.

CONVALLARIA.

Solomon's Seal is employed as a demulcent in diseases of the respiratory passages. It is thought to be of much utility in hemorrhoidal affections when irritable or inflamed, and in other inflammatory states of the bowels; also in leucorrhœa and gonorrhœa.

OLEUM OLIVÆ.

Olive oil, elsewhere described (see Cathartics), is demulcent, emollient, laxative and nutritious. Its dietetical uses are limited; it is much used on salads, and in some countries in the place of butter. It is exhibited as a demulcent and laxative in irritated and inflamed states of the bowels, and in cases of irritant poisoning. It is given to involve acrid and corrosive substances, and sheathe the stomach and intestines from their action. It is much employed to counteract the effects of vegetable acrids and corrosive minerals. As a demulcent it is used in inflamed states of the gastro-intestinal mucous membranes, and in those of the respiratory passages.

MARANTA.

Arrow-root is highly demulcent as well as nutritive, and is easily digested. For these reasons, it is well adapted as an article of food for the sick, convalescent, and to infants after weaning, or when the mother's milk is insufficient to sustain the child. Owing to its demulcent qualities it affords an excellent article of diet in irritated or inflamed states of the gastro-intestinal and pulmonary mucous surfaces. It is valuable as a dietetic agent in cases of extreme prostration, and during convalescence, not only on aceonnt of its demulcent qualities, but because it imposes so light a task upon the digestive organs to elaborate it for the sustenance of the system.

It is prepared for use by boiling one tablespoonful of it in a pint of milk or water. It is usually first made into a paste with a little cold water, when the boiling water or milk is to be gradually added, the solution being briskly agitated at the same time. Milk is usually employed in its preparation for children, and it may be used for adults, unless contraindicated.

TAPIOCA.

Tapioca is employed as an article of diet rather than as a medicinal agent. It is nutritious, destitute of irritating qualities, very easy of digestion and highly demulcent, and consequently well adapted to the wants of the sick and convalescent. It may be employed in febrile and inflammatory states of the system, and in cases of extreme prostration. It is appropriate in the bowel complaints of children, and as an article of diet when the mother furnishes a scanty supply of milk; also while the child is being weaned. Its properties and uses are precisely like those of Arrow-root.

It is prepared for use by boiling in water or milk, and flavored with sugar, lemon-juice, etc., and in cases of great exhaustion, spices, as nutmeg and cinnamon, may be added, and even brandy or wine if indicated.

SAGO.

Sago is demulcent, nutritive, and easy of digestion, and is highly valued by oriental nations as an article of food. It constitutes a light, unirritating, nutritious and easily digestible article of diet for the invalid in dysentery, diarrhœa, etc.; also in the diseases of infants, and in febrile and inflammatory disorders, when stronger or more stimulating food would be injurious.

AVENÆ FARINA.

Oatmeal forms an excellent diet for invalids. It is highly nutritious, though less so than wheaten flour, and very light and easily digestible when properly prepared. It is employed as a dietetic agent in febrile and inflammatory diseases, during the convalescence of most acute disorders, and after parturition.

The gruel made with oatmeal is bland, nutritious, easily digested, and being laxative, is preferable to the purely mucilaginous or amylaceous preparations already named. As a demulcent, it is employed in cases of poisoning with acrid substances, when amylum or starch can not be obtained.

AMYLUM.

Wheat exceeds all the other cereal grains in the quantity of its nutritive properties, owing to the large amount of gluten which it contains. It affords the finest, whitest, and most digestible kind of bread. The flour furnished by wheat is used in medicine in the formation of emollient cataplasms and demulcent preparations. Gluten or unboiled flour, made into a thin paste or mucilage, with cold water, is used as an antidotal agent in poisoning with corrosive sublimate, iodine, sulphate of copper, and other corrosive mineral poisons. It is sometimes sprinkled upon burnt or scalded parts, and in pharmacy it is used in the formation of pills.

Starch is highly nutritious and demulcent, but difficult of digestion and not pleasant to the taste, and is not, therefore, used alone as an article of diet. Starch is exhibited as an antidote to iodine and other acrid or corrosive agents, to prevent their local action. It is often employed as an emollient and demulcent clyster in dysentery and other affections of the large intestines, either alone or as a vehicle for the exhibition of opium, morphia, or other active drugs.

Starch is frequently employed as a desiccant or dusting substance, it being applied in the form of a dry powder to absorb acrid or irritating secretions, and prevent excoriations in parts that come in contact, to bed sores, etc.

HORDEUM.

Barley is another of those dietetic agents possessed of a large amount of nutritive matter. It is demulcent and easy of digestion. The husk of barley is said to be somewhat acrid and aperient.

Barley-water is in much request as a demulcent drink in febrile affections, inflammation of the respiratory organs, and in the alimentary canal, whether the result of acrid poisons or produced by other causes.

ORYZA.

Rice, like the preceding dietetic agents, is highly nutritive and demulcent; very easily digested, and less aperient than other cereal grains. Hence it is a valuable article of diet in diarrhœa, dysentery, and when the bowels are weak or irritable; also in fevers, inflammations, and in the convalescent stages of acute diseases generally, when a mild, digestible aliment is alone admissible. It constitutes the principal diet of whole nations, and is extensively employed for this purpose in the United States. A decoction of rice is a useful nutritive drink in fevers and inflammatory affections.

SACCHARUM.

The different varieties of Sugar and saccharine principles so extensively employed for dietetical and condimentary purposes, are also valuable for their therapeutical properties. For a full detail of their medicinal uses, the reader is referred to this article under the head of Alteratives.

Sugar is highly nutritious and demulcent. That it is highly nutritive is proved by the reports of those who have traveled in the sugar-growing countries. "During the sugar season of the West India islands, every negro on the plantations, and animal, even the dogs, grow fat."—*Pereira.* As a demulcent, it is used in coughs, colds, bronchial and consumptive diseases, both as an independent agent, and in the form of candies, syrups, cough mixtures, etc. It is recommended and even employed as a chemical antidote to the salts of copper, lead, gold, silver and mercury. It is dissolved in new milk, and swallowed freely in cases of poisoning with corrosive sublimate, verdigris and other corrosive agents. The benefit resulting from its use in these cases is clearly referable to its demulcent action in soothing and sheathing the intestinal mucous membrane from the action of the corrosive irritant.

LAC.

Milk is extensively and quite generally employed as a dietetical agent by the inhabitants of various portions of the globe. It is readily digestible. This, however, is not invariably the case with adults, and with certain dyspeptics. As a medicinal agent, it is employed chiefly as a demulcent and emollient. As a demulcent it is valuable in irritation of the pulmonary and digestive organs; also when caustic or corrosive substances have been swallowed. It is exhibited as an antidote in cases of poisoning with the corrosive sublimate, bichloride of tin, sulphate of copper, mineral acids, and other caustic or acrid agents.

OVUM.

Eggs are extensively employed for dietetical purposes, on which account they merit consideration in this place. They are also deserving of notice as medicinal agents. The white of the egg is demulcent, and as such is used to sheathe the mucous surfaces of the intestinal tube from the action of acrid or corrosive poisons, by involving them, and thus protecting the organs from their contact. It is also regarded as a chemical agent or antidote. "Its efficacy in these cases," says Pereira, "depends upon its chemical properties." The cases of poisoning in which it is used as an antidote are those from the bichloride of mercury, bichloride of tin, and the sulphate of copper.

SEVUM.

Although Mutton Suet is chiefly employed as a topical application, or as an emollient, yet it is sometimes used for internal purposes. This, like other fatty substances, is nutritious, but not easily digestible. It is also demulcent, for which reason it is sometimes used in dysentery, prepared by boiling in milk, to which spices and flavoring agents are added. When prepared in the manner as above named, it is highly esteemed in the disease referred to, on account of its soothing influence upon the irritated, inflamed or abraded mucous membrane of the bowels. When prepared in the same or a similar way, it constitutes quite a valuable enema in the same affection. It should be injected into the bowels, and retained as long as practicable, when it acts as an emollient, demulcent and nutritive agent. For purposes of this kind, the fresh suet or the fatty portions of mutton just slaughtered, are employed.

As a local application its effects are those of an emollient, for which it is much used as the basis of ointments, cerates, plasters, etc. It is preferred to lard in many cases, owing to its greater consistence. It is sometimes employed as a dressing to blisters, burns, abraded surfaces, irritable ulcers, etc.

CETACEUM.

The diseases in which Spermaceti has been used as an internal agent, are those affecting mucous surfaces, as diarrhœa, dysentery and inflammation of the bronchial mucous membrane. Its use for these purposes is now nearly obsolete, as it possesses no virtues entitling it to special notice in these cases.

FICUS.

Figs are esteemed demulcent, nutritive and laxative. In countries where they abound, they are much used for their nutritive qualities; they are liable, however, if taken too freely, to cause diarrhœa, flatulence, colic, etc. They are mostly used as an article of diet, in cases of constipation. They are added to demulcent and nutritive decoctions to give flavor, and sometimes boiled or roasted, and applied to gum-boils, painful swellings, etc., as a poultice or suppurative cataplasm.

UVA PASSA.

Raisins possess nutritive, demulcent and laxative properties, but are difficult of digestion, and are apt to produce flatulency. They are principally used to give flavor to dietetic agents and demulcent beverages, as the arrow-root, sago, althea, barley, oatmeal-gruel, etc.

MYRTLE WAX.

Myrtle Wax has been employed in some parts of the United States with much success in dysentery. Dr. Fahnestock derived great advantage from its exhibition when that disease prevailed in an epidemic form. He exhibited the powdered wax in doses of a teaspoonful, incorporated with mucilage or simple syrup. He is said to have used it in dysentery of a typhoid form, rubbed up with the oil of cinnamon, premising in all cases with gentle evacuants.

CLASS XXVI.

EMOLLIENTS.

Emollients are a very important class of topical agents employed for the purpose of softening and relaxing the living animal fiber. These agents diminish the force of cohesion between the particles of matter to which they are applied, and render them more lax and flexible.

Dr. A. T. Thomson uses the terms emollient, demulcent and relaxant as synonymous. He defines them to be "substances which diminish the vital tension of the tissues, and lessen the acrimony by lubricating, softening and rendering more flexible the solid part of the body."

We have already stated, under the class of demulcents, that the terms when used as synonymous are misapplied and calculated to confuse the mind of the student. We shall therefore, in this case employ the term emollient not in connection with that of demulcent, and not as synonymous. While the term demulcent is applied exclusively to the use of internal medicaments, that of emollient is applied exclusively to those of a topical and external character.

These agents, as stated by Dr. Thomson, diminish the vital tension of the tissues; they soften and relax the animal fiber, and render the solid parts of the body more flexible.

When oils, ointments, lard, etc., are applied to parts that are tense and resisting, they are insinuated between the particles; they lessen cohesion, soften and relax the tissues, and prove valuable therapeutic agents in numerous cases in which there is tension or rigidity of parts. This is especially the case when the perineum offers resistance to the advancing vertex of the child in parturition. The friction instituted in the application of warm emollient agents, as oils, lard, etc., or sitting over the vapor of bitter herbs, exerts a very salutary influence in softening and relaxing the parts, and thus overcoming, in a conspicuous manner, the strong resistance presented to the advancement of the labor. They are very important local applications in bruises, injuries, sprains, abrasions, contusions, boils, ophthalmia, painful tumors, painful and irritable ulcers, superficial or deep-seated congestions or inflammations. They soften and relax the tense condition of the parts, soothe and allay inflammation, and are of great utility in relieving pain and promoting resolution. By softening and relaxing the tissues, they act as discutients. Those into which some of the narcotic agents enter, are found to be the most effectual as discutients, and should be employed in cancerous ulcerations of a painful character, in scirrhus or cancerous tumors, scrofulous and syphilitic tumors, etc., to bring about resolution.

In all local, circumscribed inflammatory affections this class of agents is found to be of the greatest utility in effecting a dispersion of the local exalted organic excitement, and thus preventing suppuration, if resorted to in the early stages of the complaint. If, however, the period has elapsed during which they can prove beneficial as resolvents, they will still be found valuable in softening and relaxing the parts, diminishing the vital tension and cohesive attractions of the tissues involved in the *phlegmasia*, and in promoting suppuration and an early discharge of the purulent secretion. Hence their utility in boils, tumors, etc., of every kind.

If the emollient is of an unctuous character, and is applied by friction, it insinuates itself between the solid particles or into the solid fiber, and thus diminishes the density and probably lessens the friction between the molecules of matter involved in the suppurative process; but warm cataplasms and warm fomentations prove advantageous by their soothing, softening and relaxing influence, as has been before stated.

Bland and mucilaginous lotions applied to the eye in ophthalmia, or to the surface in cases of blisters, excoriations, erysipelatous affections, etc., exert their salutary influence in the same way.

Warm *cataplasms*, *fomentations*, *cloths*, vapor of warm *water*, *vinegar*, spirits, etc., when applied to the surface at a temperature a few degrees below the ordinary warmth of the body proves emollient; but when applied at a temperature a few degrees above that (say 120°), it then acts as a *rubefacient* and is really a very potent revellent.

We often apply hot *cloths*, hot *fomentations*, heated *vapor*, etc., to the human system, with a view to secure their stimulant or *revulsive* and *emollient* effects, for if applied to the surface at a temperature of from 110 to 130, it speedily produces rubefaction of the part with which it is brought in contact, and hence its utility in deep-seated inflammation, as in peritonitis, the various forms of pneumonia, rheumatism, etc.; but as the temperature subsides the revulsive influence is lost, when it soothes and acts as a sedative, it then becomes *emollient*; then "the relaxing effects of warmth and moisture upon the extreme vessels of the surface (says Paris) is propagated by contiguous sympathy to the deeper seated organs." Thus it will be seen the agents applied at different degrees of temperature may prove *revulsive* and *emollient*. As revulsives, we can see how deep-seated congestions or inflammations may be relieved by an extensive application of these agents. The application should be large and rapidly reapplied if the case be urgent, in order to secure the full advantages which this class of medicinal agents are capable of affording. If applied at a lower temperature it relaxes the parts to which it is applied, and that influence is extended to deep-seated parts by a sympathetic action, and the engorged vessels or tissues inflamed are relieved—a similar influence is extended to every part of the cutaneous capillaries. They tend to relax the cutaneous constrictions if extensively applied, and promote perspiration; the same remarks apply to the relief of pulmonary constriction, spasms of various kinds, convulsions, etc. In short they are important topical applications in all acute inflammatory affections.

Their influence upon the general system is often very clearly manifested in subduing the local irritation and preventing the general system from participating or sympathizing in the local affection: general irritation or fever is often prevented, the amount of disease greatly lessened, and in many cases spasms or tetanic convulsions prevented, by the soothing influences of anodyne and emollient applications.

ULMUS FULVA.

THE BARK.

THERAPEUTIC ACTION.—Ulmus Fulva is emollient, demulcent, and nutritive Among the various agents employed as emollients none surpass this for all ordinary purposes. In burns, scalds, abraded surfaces, boils, irritable and painful ulcers, wounds, painful inflammatory tumors, and indeed all cases where a soothing, softening and relaxing application is required, none will be found to answer a better purpose.

As a demulcent, Ulmus is highly useful in all irritated or inflamed states of mucous surfaces, as in catarrhal and pneumonic affections, gastritis, enteritis, and the various inflamed states of the urinary organs. Its mucilage is beneficial as a gargle in aphthous and inflamed states of the mouth, fauces, tonsils and throat. It is also used with advantage as an injection or lavement in dysentery, fistulous hemorrhoids, etc.

Cataplasma Ulmi.—℞ Elm bark in fine powder, q. s.; boiling or cold water, as desired, enough to form a cataplasm.

LINUM.

THE SEEDS OF LINUM USITATISSIMUM.

THERAPEUTIC ACTION.—Flaxseed possesses emollient, demulcent, and nutritive properties. The meal mixed with hot water constitutes one of our most important emollient cataplasms for dressing blisters, burns or scalds, irritable and inflamed ulcers, and other painful local affections requiring the use of soothing and relaxing applications.

Cataplasma Lini.—Flax-seed meal, any quantity; boiling water sufficient to form a cataplasm. To prevent adhesion and preserve its softness the surface should be covered with sweet oil. It serves to promote suppuration and relieve pain and irritation by softening and relaxing the tense condition of the inflamed vessels and surrounding tissues.

Oleum Lini.—Flax-seed oil is often employed as a topical application in cases of burns, and usually in combination with lime-water. It is sometimes used in conjunction with other agents as a purgative enema.

CONVALLARIA.

Solomon's Seal is sometimes employed as an emollient poultice in cases of inflammatory tumors, boils, and other local affections requiring the use of soothing cataplasms. It is also said to be useful both as an internal and external application in piles, and it has been applied locally in cases of cutaneous affections with reputed benefit. The mucilage is employed advantageously in erysipelatous swellings and inflammations, by means of cloths dipped in it and applied to the surface.

ALTHÆA.

The bruised root constitutes an excellent cataplasm in all cases requiring the use of emollients, as irritable, foul and gangrenous ulcers, burns, scalds, chilblains, inflammation of the bowels with a tendency to mortification, etc.; also in cases of boils, bruises and inflammatory tumors. The cataplasm of the Marsh-mallow is prepared in the manner recommended for the preparation of the Ulmus. Cloths dipped in the mucilage of the Mallows are sometimes applied to inflamed surfaces as emollients.

VIOLA.

The different species of Violet have been used in the form of a poultice to promote suppuration and subdue inflammation. The tops are boiled in milk to the proper consistence, or the liquid expressed. The herbaceous parts are demulcent and laxative, and are used in coughs and pectoral diseases, also in urinary affections.

OLEUM OLIVÆ.

Olive Oil has already received full notice under the class of Cathartics. It is much used as an emollient in the formation of ointments, salves, cerates, plasters, etc., also in the preparation of liniments. It is also applied to irritable and inflamed surfaces to protect them from the effects of the atmosphere, and to soften and relax the parts.

OLEUM AMYGDALA.

The expressed Oil of both the Sweet and Bitter Almonds, is sometimes employed in the form of soaps as a local application, and sometimes in the form of frictions to the surface. It is also used in deafness dependent upon lack of the ceruminous secretion.

TYPHA LATIFOLIA.

The roots of the Reed Mace are employed as an emollient and discutient cataplasm in cases of boils, painful, indolent and indurated tumors and white swellings.

LILIUM CANDIDUM.

The root of the common Meadow Lily is said to possess emollient, demulcent, tonic, astringent and nutritive qualities. The roots, when roasted or boiled, constitute a useful emollient poultice, highly beneficial in painful tumors and local inflammatory affections.

TILIA GLABRA.

The bark of the Basswood or Linden Tree, when pounded or scraped fine, and properly prepared by simmering or boiling in milk, forms an excellent emollient poultice. It may be used in irritable and painful ulcers, inflammatory swellings, burns, scalds, etc. It is nearly equal to the slippery-elm in point of value as a poultice, although but little used for that purpose.

SAURURUS CERNUUS.

The roots of the Saururus Cernuus or Lizard Tail, are highly useful in the form of a poultice. They possess valuable discutient, as well as emollient properties, which render them of much utility in painful swellings, scrofulous tumors and local inflammations, as the cynancheal affections, and in deep-seated disorders. It constitutes an excellent dressing for blisters, burns, erysipelatous inflammations, etc.

DAUCI.

The root of the cultivated Carrot, when boiled in milk or water until it attains a degree of softness suitable to form a cataplasm, constitutes a useful poultice in all cases of inflammation or ulceration in which the preceding agents are employed. The skin is to be removed and the boiled carrot mashed into a soft pulp. To obtain the peculiar influence of the carrot, the fresh roots should be grated. When the cataplasm is thus prepared, it acts as a feeble excitant to the vessels involved in the ulcerative process.

SOLANUM TUBEROSUM.

The root of common Potato, when boiled until it is soft and mashed into a pulp, to which a little lard, fresh butter, or some animal oil is added, to render it moist and give it a proper consistence for a poultice, answers a useful purpose in cases of boils, painful tumors, etc.

MEDULLA SASSAFRAS.

The mucilage obtained by macerating the pith of Sassafras in water, is useful when applied by means of cloths to inflamed surfaces. It is often resorted to in cases of acute ophthalmia. It serves to soothe and allay inflammation, relieve pain, maintain a soft and relaxed state of the parts, and protect them from the action of the atmosphere.

FOMENTATIONS.

Fomentations of Hops, Tansy, Wormwood, Smart-weed, Mullen, Chamomile, May-weed, Eupatorium, and sundry other herbs, whether used singly or collectively, prove highly useful in both external and deep-seated inflammations. Their utility depends upon their warmth and moisture in part, but independent of these qualities, they undoubtedly exercise a specific influence, at least many of them, over the organs or parts to which they are applied. That such is the result when narcotics are used, no one can deny; and if they produce results that can not be ascribed to the warmth and moisture of the fomentation simply, is it unreasonable to suppose other agents may produce different effects also?

Fomentations are valuable in pleuritis and other varieties of pulmonic inflammation; also in hepatitis, enteritis, and other forms of abdominal inflammation. They are also of much service in rheumatism, white swellings, diseases of the joints, enlarged glands, inflamed tumors, old, indolent and irritable ulcers, and in hemorrhoids and other local and painful affections. If applied very warm, they first act as revulsives, and subsequently as emollients; by overcoming the tense or rigid state of the muscular fiber, softening and relaxing the parts, and subduing inflammation, promoting suppuration, etc., they contribute much to the relief of painful local affections. Cloths dipped in hot water and repeatedly applied, exert a similar, though less appreciable influence, over local inflammatory diseases, thus proving, as we think, the specific influence and superior efficacy of the different bitter herb fomentations over the simple warmth and moisture of the warm moist cloths. The vapor of warm water or burning alcohol, if the temperature does not exceed one hundred or one hundred and ten degrees, serves to allay pain, irritation and inflammation, by softening the tense tissues and relaxing the inflamed fiber.

GOSSYPIUM.

Raw Cotton is chiefly employed as an emollient dressing to recent burns, scalds, blisters, erysipelas, etc., to protect the inflamed part from the atmosphere, to relieve pain, diminish inflammation, prevent vesication, and to absorb the fluid, whether ichorous, sanious, or puruloid, which may be secreted by the ulcerated or inflamed surface. In cases of burns, the earlier it is applied the better, although it is employed in all stages. If any blisters are present, they should be opened.

A large pledget affords, in many instances, much relief in lumbago and other forms of rheumatism. The ordinary wadding, prepared for milliners and other purposes, is the most convenient for use. This should be applied in successive layers, the unstarched side (if it be starched), next the burnt surface, so as to entirely exclude the air. Surgeons think it advisable not to remove it in cases of burns for five or six days, and then only the outer coverings, unless circumstances render the removal of the entire covering necessary.

"Some surgeons, in extensive burns, use a spirituous or turpentine wash before applying the cotton."

ADEPS.

Lard is emollient, demulcent and nutritive. It is difficult of digestion, and is seldom if ever employed internally for medicinal purposes.

Lard is frequently used as an emollient by means of frictions in cases of rigidity of the perineum and other soft parts concerned in the process of generation during the act of parturition. It is in common request among accoucheurs for lubricating the hand, in rendering assistance to the parturient female. Lard is sometimes added to poultices to render them soft, preserve their consistence, and prevent adhesion.

It is chiefly used in pharmacy as an ingredient of ointments, cerates and liniments, for which it is extensively employed.

It is frequently a constituent of laxative enemata, and is sometimes employed alone as a simple dressing to ulcers, blisters and excoriated surfaces, care being taken to avoid that which is rancid. Pereira and Christison both assert that irritation or ulceration ensue when it is employed as a dressing to blistered surfaces, without observing this precaution. The fresh lard, or that free from salt, should always be sought.

CLASS XXVII.

DILUENTS OR ATTENUANTS.

Diluents or attenuants are imperiously demanded by the laws of animal instinct, to lessen the inspissated and viscid character of the blood, both in a state of health and disease. They allay thirst and render acrid secretions less irritating and more abundant, by furnishing the necessary supply of materials for secretion, and in this way they lessen irritation, inflammation and fever.

When we take into consideration the incessant drain of fluids by the great emunctories of the system, as the urinary and intestinal secretions, the cutaneous and pulmonary tranpirations, and the preponderance which the liquids entering into the composition of the animal economy bear to the solids, it is not strange that the demand for liquids should be more imperious than it is for solids. The sensation of thirst is often dependent upon the inspissation of the blood, and as soon as it is diluted by injecting fluids into the veins, it is allayed. If taken into the stomach or injected into the bowels, it is absorbed, and dilutes the blood and allays thirst. Thirst is also a very prominent evidence of disease, especially those of a febrile and inflammatory character. In such cases their utility is not exclusively dependent upon their attenuating properties. The demand for drinks does not always arise from inspissation of the circulating fluids. Hence they can not be properly called diluents (when this is not the case). The highly exalted organic action which arises in the mucous membranes of the alimentary canal, occasions the thirst in these cases, and the well-known influence of liquids, and *particularly cold water* and *acidulated drinks*, etc., in diminishing this excitement and allaying the thirst, explains their therapeutic application in such cases. Cold drinks act as refrigerants. Warm drinks do not. Cold drinks lessen the organic actions in the intestinal mucous membranes, and warm ones are comparatively inert; hence the demand for cold drinks in febrile excitement. In many cases of fever the sensation of thirst is very imperious, arising from the united causes just referred to, that is, from the diminution of the serous fluid in the blood, and also from the morbid erythism existing in the mucous membranes. So long as this erythism, or exalted organic action in these membranes exists imbibition or venous absorption goes on slowly, and hence the difficulty of allaying thirst. From what has been said, it will readily be seen why it is we have such intense thirst in Asiatic cholera, cholera morbus, and even after the action of a powerful hydragogue cathartic, and the reason why it is so difficult to allay that thirst. If no such exaltation of organic action existed, the reduction of the serous fluid would facilitate absorption, and the urgent thirst would be speedily allayed.

In febrile and inflammatory states of the system, particularly in inflammation of the mucous membranes, the secretions become acrid, and act as local irritants or excitants, and often exert an agency in maintaining the febrile and inflammatory excitement; such is the case in gastritis and enteritis. In bronchitis the saline secretion excites the mucous membrane and induces coughing to expel it. In such cases warm diluent drinks, cold water, demulcent drinks, etc., lessen the acrimony of the secretion by diluting it, or they may involve it and shield the abraded and morbidly sensitive mucous surfaces from the action of the acrid secretions and accumulations. It is true they do not act directly upon the mucous surface of the lungs in pulmonic affections, but their influence upon the mucous surfaces is extended to the lungs by continuous sympathy; and hence the importance of mucilaginous diluents in those affections.

In diseases of the urinary organs, particularly in inflammation of those organs, as in nephritis, cystitis, or urethritis, the free use of demulcent or mucilaginous infusions is of unquestionable utility. They serve to weaken the saline compound—the urine—and lessen its stimulating properties, and, in part, to prevent the irritation which it would produce upon the inflamed parts.

They may either facilitate or retard digestion, depending upon the quantity of liquids taken. If the salivary and other secretions are scanty, and not sufficient to exert upon the alimentary mass the due solvent influence preparatory to the gastric action upon it, they are found to promote the process of chymification; on the contrary, if no such aid is required, the free use of diluents, a short time before, during or immediately after meals, will retard the process of chymification by too much diluting the gastric secretions, and by rendering the alimentary mass too soft and pulpy for the stomach to exert its necessary influence upon.

In cases where acrid and poisonous agents are taken into the stomach, diluents are required to weaken the deleterious poison and prevent it from acting violently upon the stomach. In the same cases they favor the action of emetics, and should be used freely to cooperate with them in the production of emesis.

In the treatment of dropsy, the ordinary use of diluents is objectionable. The exhalation or dropsical effusion is derived from the blood, and as a corresponding diminution in the quantity of that fluid must follow, and as absorption is slow in proportion to the existing vascular fulness or repletion, and active in proportion to the reduction of it, it is evident the free use of diluents, by furnishing the materials for absorption, would retard the removal of the dropsical effusion, and is, therefore, objectionable. However, the same objection would not rest against the use of active diuretic infusions, as a solution of the bitartrate of potassa, juniper berries, horse-radish, etc.; for though they would supply materials for absorption, yet the advantages gained by the increased flow of urine would preponderate and render them valuable therapeutic agents.

They are also important as diaphoretics. The free use of warm diluent drinks removes the constriction of the cutaneous emunctories and promotes perspiration; and hence their great importance as diaphoretics, diuretics, etc., in the treatment of febrile and inflammatory diseases. Even cold water, acidulated and refrigerant drinks frequently act as diaphoretics and diuretics, as well as diluents. When there is vascular excitement, with a hot, dry, and constricted state of the dermoid tissue, there is a corresponding exaltation of organic action on the mucous membranes, and in the internal organs generally. In such cases the sedative influence of cold fluids lessens the internal orgasm, and by continuous sympathy abates the external heat, the capillary excitement, and removes the cutaneous spasm, and proves diaphoretic, diluent, and febrifuge.

Another cogent argument in favor of the employment of simple diluents or *unmedicated medicaments* in febrile and inflammatory excitement, is the continued waste which the system has to sustain in the various secretions and transpirations. They diminish the aqueous portion of the blood rapidly, and when this reduction is not compensated by the ingestion and absorption of more, the residue of the blood loses its requisite fluidity; hence it does not flow so freely through the capillary system; not only so, it becomes too exciting, too stimulating to the heart and arteries, and causes congestions and inflammations, and often aids in maintaining the excited organic actions until the continued excitement exhausts the recuperative energies of the system and the patient. The superiority of that system of practice which tolerates the use of no medicines that will not admit of the free use of cold drinks in the treatment of febrile and inflammatory diseases, is a desideratum of infinite importance to the sick, as well as a source of great comfort to the parched and famishing patient. These sanitary influences are of immense importance in the treatment of many diseases. They subdue augmented arterial excitement, restore the secretions and maintain their healthful qualities, and thus prevent them from becoming vitiated and irritating. They calm and allay nervous excitement, and though simple, are none the less important as curative means.

DIVISION XV.

CLASS XXVIII.

ANTIDOTES.

Antidotes are defined to be those agents which are capable of counteracting the injurious effects of poisons. They may properly be divided into two classes, *direct* and *indirect*, according to their action: thus, an agent which, when administered, will chemically combine with a poison and render it insoluble or inert, would be called a direct antidote; while one that would evacuate it from the system, or shield the mucous membrane from its action, would be termed indirect.

In the treatment of cases of poisoning, Pereira mentions five indications to be fulfilled:

"1. The most important is the removal of the poison from the part to which it has been applied. From the *stomach* it is removed by the stomach-pump, by the use of emetics, by tickling the throat with the finger or a feather dipped in oil; and, in the case of irritant poisons, by promoting vomiting by diluents and demulcents. In corrosive poisoning (as by strong acids and alkalies), the use of the stomach-pump is dangerous. As house or domestic emetics, a dessertspoonful of flour of mustard, or a tablespoonful of common salt, stirred up in a tumblerful of water, or strong soapsuds, may be used. But the more effective emetics are one or two scruples of sulphate of zinc, or five to fifteen grains of sulphate of copper. The emetic should be given in a glass of warm water, and repeated in a quarter of an hour if it has not operated. From the *bowels* the poison is best removed by the use of castor-oil and laxative enemata.

"2. Another indication in the treatment of poisoning is the use of chemical neutralizers, called *chemical antidotes.* These either render the poison insoluble, and thereby prevent its absorption, or convert it into a harmless soluble substance.

"3. A third indication is to sheathe the living part from contact with the poison, by which not only the topical irritant action, but also the absorption of the poison is prevented or lessened. These may be termed *mechanical antidotes.* Thus in poisoning by acrid or caustic substances, considerable relief is attained from the use of diluents, demulcent and mucilaginous liquids, oils, and fine impalpable powders. They lessen the irritant effect of the poison by enveloping it; and by sheathing the stomach and bowels, they also retard absorption.

"4. A fourth indication is to counteract or relieve the effects of the poison. This is effected by agents which may conveniently be termed *dynamical antidotes.* Thus coffee is given to counteract the narcotism produced by opium; ammonia to relieve the depression caused by foxglove or prussic-acid; opium to allay the acute pain produced by irritant poisons, etc.

"5. A fifth indication is to promote a speedy removal of the poison from the system after its absorption. Most poisons are absorbed into the blood, and are subsequently expelled from the system by the excreting organs; but it is very doubtful whether we have any means of accelerating their elimination."

Poisons have been very judiciously classed by most toxicologists under the three following heads: *Irritants*, *Narcotics*, and *Acro-Narcotics* or *Narcotico-Acrids.* These very significant terms convey to the mind the different effects and symptoms which may be expected to arise when the articles of either class are taken in poisonous doses.

The first class — irritants — embraces the vegetable acrids and corrosive minerals. These agents produce *gastro-intestinal inflammation*, and if still more freely taken, a destruction of the mucous membrane. Among the vegetable acrids we might name a large number, including most of the emetics and drastic cathartics, as the squill, euphorbia, etc., among the former, and the scammony, elaterium, gamboge, etc., from the latter. As examples of the corrosive mineral agents, we might name the different preparations of arsenic, antimony, mercury, copper, zinc, silver, gold, etc.

The second class embraces all those *narcotics* which are not possessed of acrid properties; as the opium, morphia and its salts, conium, stramonium, belladonna, hyoscyamus, etc. They act feebly on the part to which they are applied, but powerfully upon the brain and nervous system.

The third class presents us with a list of agents which partake somewhat of the nature and properties of both the former. The *acro-narcotics* are very apt to produce gastro-enteric inflammation if incautiously used, and many of them if taken in large quantities, act very powerfully on the brain and nervous system. Many very deadly poisons, as well as valuable medicinal agents belong to this class. As examples we may enumerate the aconite, veratrum album and viride, hellebore, tobacco, lobelia, arnica, etc., all of which frequently exhibit the evidences of their irritant and narcotic powers, even when administered in medicinal doses.

In the treatment of all cases of poisoning, no matter what agent has been used, certain general indications have to be fulfilled. Thus a first and prominent indication is to remove the poison from the stomach as speedily as possible. This may be accomplished with the stomach-pump, by the use of emetics, or mechanical irritation of the fauces to produce vomiting. If the poison is readily soluble, dry vomiting is preferable for the reason that when the poison is dissolved in a large quantity of fluid, it is absorbed with more facility, than when no diluents are administered. If, however, the stomach-pump is at hand, free dilution is not objectionable, providing the pump is immediately used. These remarks apply more especially to the narcotic poisons. If the poison is a vegetable acrid or corrosive mineral, the use of diluents, mucilaginous or demulcent liquids, oil, etc., are indicated to shield the stomach against their corrosive influence, and to some extent prevent absorption.

If there is a chemical antidote to the poison employed,—one that will either change it into an insoluble or inert compound,—this should be employed from the first, and continued until all symptoms of poisoning are removed. If the poison has been absorbed and produced its general effects upon the system, these will have to be counteracted as a general rule, by agents which have an opposite effect. Sometimes it is necessary to employ these three means at the same time; while we may attempt to remove any free poison from the stomach by evacuating that viscus, we administer the chemical antidote, and counteract its general influence by other measures.

Agents which promote absorption should be invariably avoided, when the poison taken is liable to be absorbed and produce general effects.

The effects of local poisoning, as the bite of a rabid animal, the rattlesnake, viper, copperhead, etc., and wounds made in dissection, or with an instrument impregnated with putrefactive animal matter, are best counteracted by the immediate excission of the part, or by scarifying and cupping. In this way we effect the removal of the blood impregnated with the poison, as well as the poison itself Ligatures applied to a limb above the part bitten or wounded, act upon the same principle. Caustics are also occasionally applied to the seat of the injury and the part converted into an eschar, suppuration is established, and the poison if not destroyed is drained from the injured parts. If the ligature, cups or caustic be relied on, the earlier the application the greater will be the prospect of success. The influence of these animal poisons is always depressing, and hence it is of the greatest importance that tonics and stimulants should be freely employed to counteract this. Free use should also be made of those agents which when taken internally counteract the septic tendency in the blood.

The physician is not always called upon to treat the early effects of poisons, and even if he were, secondary phenomena would generally arise demanding his attention. These secondary symptoms or poison-induced diseases, are to be treated on general principles, without any especial regard to the cause which produced them.

The following table of poisons, their symptoms and treatment, has been compiled from the best sources:

IRRITANT POISONS.

Poisons.	Symptoms.	Treatment.
ACIDS. *Sulphuric.* *Nitric.* *Muriatic.* *Nitro-Muriatic.* *Oxalic.* *Acetic.* *Citric.* *Tartaric.* REMARKS.—The animal and vegetable acids (with the exception of the oxalic) are rarely used as poisons. The oxalic acid, from its resemblance to epsom salts, has been frequently taken by mistake; and, from the ease with which it is procured, has frequently been employed as an instrument of murder.	When a poison of this class is internally administered, the consequences which it produces are either the immediate and complete destruction of the parts with which it comes in contact (an effect determined by the more powerful escharotics alone), or such a degree of irritation as leads to inflammation of some part of the intestinal tract, succeeded by its usual consequences—increased vascularity, effusion of coagulable lymph, and occasionally of blood, ulceration, softening, and sometimes thickening of the villous coat, and lastly, gangrene or slough. These effects are observable in the mouth and fauces, in the œsophagus, stomach, small and great intestines; but they do not invariably occur in all these places, nor in all with the same degree of intensity. Such being the pathological condition of the intestinal tube, the accompanying symptoms may be easily conceived. The epigastrium becomes the seat of a burning pain, and shortly after vomiting ensues, by which the contents of the stomach are first rejected, and subsequently a viscid mucus, streaked with, and often containing coagula of blood. The epigastrium is obviously swollen, tense and tender, and the distress in this region is greatly augmented by pressure. The inflammation is sometimes confined to the stomach, but more usually it extends to the lower intestines, producing general abdominal pain and tenderness upon pressure, purging accompanied by tenesmus and bloody dejections. When the deleterious substance belongs to the class of escharotics, and is either very soluble in water, or has been administered dissolved in some chemical menstruum, the mouth, tongue and throat are the parts which first suffer from its action, and to which the earliest symptoms are referred. These are burning pain and a sense of constriction in the fauces, prevent-	In poisoning with the acids, *alkalines* and the *fixea oils* are antidotes. For the mineral acids we may administer magnesia, chalk (or whiting), with milk, soapsuds, dilute solution of carbonate of soda or potassa, or almond, olive or lamp oil. With the exception of the nitric and oxalic acids, these agents may be used as antidotes indiscriminately; but in poisoning with the two acids named, the carbonates of lime and magnesia alone can be employed with safety; and for the oxalic acid the first of these is decidedly preferable, as the resulting compound, oxalate of lime, is inert. In poisoning by sulphuric acid, water should not be drank, on account of the heat generated by their mixture. The subsequent inflammation should be treated on general principles.
ALKALIES AND THEIR SALTS. *Ammonia.* Strong liquor or hartshorn. Muriate of ammonia or sal ammoniac *Potassa.* Caustic potassa or liquor potassæ. Carbonate of potassa or pearlash. Nitrate of potassa. Sulphuret of potassium. *Soda.*		The vegetable acids, as vinegar, lemon juice, citric and tartaric acids, are antidotes to the action of alkalies; as, also, are the fixed oils, they forming soaps with them, thus destroying their corrosive properties. In poisoning by nitrate of potassa, mucilaginous drinks should be freely administered, and the resulting inflammation treated on general principles. It is said that common salt, or the liquid chloride of soda, will decompose and neutralize the sulphuret of potassium.

IRRITANT POISONS—CONTINUED.

Poisons.	Symptoms.	Treatment.
EARTHS AND COMPOUNDS. *Baryta.* Carbonate of baryta. Chloride of barium. Nitrate of baryta *Lime.*	ing or materially impeding the act of deglutition, and the entrance of air into the lungs. In addition to these local symptoms, it may be also observed that the constitution will be always found to have undergone serious disturbance. The pulse will be rapid and feeble; the countenance will be flushed, or exhibit a deadly paleness; there will be excessive prostration, and the entire body will be covered with a cold and clammy sweat.—(*Apjohn.*)	In cases of poisoning by muriate of baryta, a solution of soda or magnesia administered will prove an antidote. This should be done without loss of time, for the poison acts rapidly. By this means the barytes is converted into the insoluble sulphate, which is inert. If the carbonate should have been the preparation used, the soluble sulphates should be replaced by copious draughts of dilute sulphuric acid. The antidotes for lime are the same as for the caustic alkalies.
METALS. (*a.*) ANTIMONY. *Tartar Emetic.* *Chloride* or *Butter of Antimony.* *Oxyd of Antimony.*	(*a.*) In poisoning by the preparations of antimony, the agent is generally rejected by vomiting; in fatal cases the vomiting becomes obstinate, there is burning pain in the stomach, purging accompanied with violent colicky spasms, constriction of the throat, distressing cramps of the limbs, delirium and convulsions.	In cases of poisoning by any of the preparations of antimony, if vomiting has not occurred, it should be excited by tickling the fauces with the finger or a feather dipped in oil, and by tepid bland liquids. The antidote is tannic acid, and vegetable substances containing it, as tea, galls, white-oak bark, Peruvian bark, etc., which should be immediately and freely administered in solution or infusion.
(*b.*) ARSENIC. *Arsenious Acid* or *White Arsenic.* *Yellow Sulphuret of Arsenic.* *King's Yellow.* *Red Sulphuret of Arsenic.* *Fowler's Solution.* *Arsenical Paste.* *Arsenical Soap.* *Arsenite of Copper.*	(*b.*) Nausea and faintness are the first symptoms, to which succeed a burning pain in the stomach; obstinate vomiting, which, if it does cease for a moment, is immediately excited by any kind of drink; a sensation of dryness, heat and tightness in the throat; diarrhea, accompanied with tenesmus; abdomen tense and painful; pulse small, quick and feeble; the surface cold and clammy; the urinary organs affected with violent burning pain and suppression; delirium, convulsions and death.	In cases of poisoning with any of the preparations of arsenic, the first indication is to remove from the stomach any of the free poison. For this purpose, an active emetic of ipecacuanha and mustard should be administered, and the stomach thoroughly evacuated. The *hydrated sesqui-oxyd of iron* should then be freely administered as an antidote to the poison. If it has been obtained before the emetic was given, it should not be delayed for its action, but administered immediately. Whon the poisoning has been occasioned by *arsenite of potassa* (Fowler's solution), soda, or ammonia, or by the salts of arsenious acid,

IRRITANT POISONS—CONTINUED.

Poisons.	Symptoms.	Treatment.
Children have been poisoned, it is stated, by chewing visiting cards; arsenic having been used in the enamel.		after giving the first dose, vinegar should be added to the antidote, to neutralize its acidity. The general symptoms will have to be treated upon general principles.
BISMUTH. *Nitrate of Bismuth.* *Pearl Powder.* *Oxyd of Bismuth.*		Evacuation of the poison by the stomach-pump or emetics is the first indication — milk and mucilaginous drinks are recommended to shield the stomach. The inflammatory symptoms are to be treated on general principles.
(*c.*) COPPER. *Sulphate of Copper* or *Blue Vitriol.* *Acetate of Copper* or *Verdigris.* *Carbonate of Copper.* Food cooked in dirty copper vessels, or pickles colored green by copper.	(*c.*) The symptoms of poisoning by copper are headache, cutting pains of the bowels, vomiting and purging, coppery taste in the mouth, and strong aversion to its taste, cramps in the legs, and pains in the thighs, jaundice, etc. The pulse, almost from the commencement, is small, quick and feeble.	No time should be lost, and none of the ordinary means omitted for expelling the poison from the stomach. Albumen administered in any of its forms, as white of egg, milk, etc., retards the action of the poison. The subsequent treatment should be the same as for other irritant poisons.
GOLD. *Chloride of Gold.* *Fulminating Gold.* *Purple of Cassius.* *odide of Gold.* *Cyanide of Gold.* *Chloride of Gold and Sodium.*		In poisoning by any of the different preparations of gold, the same treatment should be pursued as in poisoning by the bichloride of mercury. The salts of gold are said to be decomposed by sulphate of iron, and this has been recommended as an antidote.

IRRITANT POISONS—CONTINUED.

Poisons.	Symptoms.	Treatment.
(*d.*) LEAD. *Acetate of Lead* *Sugar of Lead.* *Carbonate of Lead.* *Red Lead.* *White Lead.* Water, food or liquors impregnated with lead, frequently produce the symptoms of lead poisoning; as, also, do the different occupations where lead is freely employed.	(*d.*) When a soluble salt of lead is taken or administered for the purpose of poisoning, the morbid phenomena that ensue are similar to those produced by other irritant poisons. But if some of the insoluble, or even small doses of the soluble preparations, is taken, or if the poison is taken with the food, water, etc., or is introduced into the system from the occupation of the patient, the results are very different. From the commencement, there are either none, or but very slight symptoms of irritation of the alimentary canal. A lead colic is after some time developed. This sometimes begins suddenly; more frequently it is preceded by gastric derangement, such as nausea and vomiting; cramps of the stomach next set in, and these gradually extend over the abdomen, and at length degenerate into a colic, scarcely to be distinguished from the ordinary form. The abdomen is usually tense, the navel drawn in; the pain is intermitting, and is relieved by pressure; the bowels are generally costive, though sometimes there is diarrhea; the urine is scanty; the saliva copiously secreted, and of a bluish color; there are dull aching pains in the limbs; the skin exhibits a dull, cadaverous aspect, and is bathed in a cold, clammy sweat; the countenance is gloomy and desponding, and the pulse, though sometimes accelerated, is generally slower than usual.	In cases of poisoning by any of the salts of lead, the first indication is to remove it from the stomach. For this purpose the sulphate of zinc is probably the best agent, as it not only produces free emesis, but also acts as an antidote. The salts of lead are converted into insoluble compounds by the administration of the sulphates of soda or magnesia in solution. The "*white liquid physic*" is also a very useful antidote. In chronic lead poisoning, attended with lead colic, the bowels should be kept regular with the cathartic last named: tonics and stimulants should be employed to increase the strength, and above all the patient should be removed from the cause of the disease.
SILVER. *Nitrate of Silver.*		Common salt immediately decomposes the nitrate of silver, destroying its activity. The inflammation should be treated on general principles.
(*e.*) MERCURY. *Bichloride of Mercury* or *Corrosive Sublimate.* *Cyanide of Mercury.* *Iodide of Mercury.* *Nitrate of Mercury.* *White Precipitate.* *Red Oxyd* or *Red Precipitate.* *Sulphate* or *Turpeth Mineral.* *Vermillion* or *Red Sulphuret.* *Calomel.*	(*e.*) Violent symptoms of irritant poisoning; harsh, metallic astringent taste; burning pain in the stomach; vomiting and purging frequently of bloody matter; often irritation of the urinary organs, and sometimes suppression; tightness and burning in the throat, occasionally so great as to prevent speech; countenance not always pale, but sometimes flushed; tendency to doze; stupor, convulsions and death.—(*Dunglison.*)	In cases of poisoning by mercury, albuminous substances, as white of egg, milk, a mixture of wheat flour, etc., should be immediately and freely administered. This does not prevent, but only retards the absorption of the poison, and consequently its constitutional effects will be liable to be produced. The inflammation, salivation, etc., will have to be treated on general principles.

IRRITANT POISONS—CONTINUED.

Poisons.	Symptoms.	Treatment.
(*f.*) ORGANIC IRRITANT POISONS. *Convolvulus Jalapa.* Jalap. *Convolvulus Scammonia.* Scammony. *Croton Tiglium.* Purging croton. *Ccumis Colocynthis* Colocynth. *Euphorbia Officinarum.* Euphorbium. Spurge. *Momordica elaterium.* Squirting cucumber. Etc., etc., etc.	(*f.*) The vegetable acrids, when swallowed in large doses, very generally give rise to vomiting, by means of which the poison is discharged. Sometimes, however, they are retained by the stomach, particularly when the quantity has been small; and in these cases diarrhea usually sets in, attended by abdominal pain, which is at first remittent, but becomes more constant in proportion to the development of inflammation in the intestinal tube. The belly now becomes tense and tender. The debility is great, and giddiness and tendency to delirium, are sometimes, though rarely, observed.	In the treatment of cases of poisoning by the vegetable irritants, the practitioner will have to be governed by general principles, as there is no chemical antidote to them known. The first indication in every case is to remove the poison from the system as soon as possible; thus, if emesis has not already been produced, an emetic, or the use of the stomach-pump, is necessary. If vomiting has been produced, it may be rendered much easier by the free use of diluents, and the stomach and bowels may be shielded from the action of the irritant by demulcents. If it should be desirable to produce catharsis, an unirritating agent, as the castor oil, would prove most useful.

ACRO-NARCOTICS.

Poisons.	Symptoms.	Treatment.
SOLANEÆ. *Atropa Belladonna.* Deadly nightshade. *Datura Stramonium.* Thorn apple. *Nicotiana Tabacum.* Tobacco.	The symptoms of poisoning by belladonna and stramonium are: dryness of the throat and fauces; dilation of the pupil and insensibility to light; delirium, usually of a very extravagant description; stupor, coma and death. Convulsions of a violent nature are rare, though, occasionally, muscular twitchings and subsultus tendinum have preceded death. The symptoms produced by tobacco are, in the first instance, slight excitement, followed by giddiness, syncope, nausea and vomiting, feeble pulse, a state of stupor or lethargy, insensible pupil, laborious breathing and convulsive twitches of the muscles generally.	In cases of poisoning with belladonna or stramonium, the first indication is to remove the poison from the stomach as soon as possible, with the stomach-pump, or an emetic. As an emetic, from half to a tablespoonful of mustard in a glass of water will probably be found the best. After the stomach has been evacuated we may derive benefit from the use of a decoction of green tea or nut-galls. The depression, and other symptoms produced, must be treated on general principles. In poisoning with tobacco, the same treatment, with the employmen of the vegetable acids and coffee, or if the depression of the vascular system be extreme, the use of the stronger stimulants, as ammonia, brandy, etc., and the cold douche should be resorted to.

ACRO-NARCOTICS—Continued.

Poisons.	Symptoms.	Treatment.
Umbelliferæ. *Conium Maculatum.* Common hemlock. *Cicuta Virosa.* Water hemlock. *Œnanthe Crocata.* Hemlock dropwort. *Æthusa Cynopium.* Fool's parsley.	The symptoms produced by *conium* are, giddiness, delirium, coma and convulsions. By the *cicuta*, gastric irritation, vomiting, giddiness, profound coma and insensibility, and finally, very violent tetanic convulsions. By the *œnanthe*, burning heat in the throat and epigastrium, stupor, and in every instance violent convulsions. By the *æthusa*, nausea, vomiting, headache, giddiness, sopor, partial paralysis and numbness of the extremities, sometimes pain in the stomach, lividity of the surface, and great dyspnea have been observed.	The treatment should be the same as for the *solaneæ;* no antidote is known, though an infusion of galls has retarded their action.
Ranunculaceæ. *Aconitum Napellus.* Monk's head. *Helleborus Niger.* Black hellebore. *Digitalis.* Purpurea.	The symptoms produced by *aconite*, are burning heat in the throat, vomiting, purging, numbness, partial paralysis, delirium and convulsions. By the *hellebore*, vomiting, delirium and convulsions. By the *digitalis*, feeble and retarded pulse, violent pain over the eyes, confusion of intellect, extreme prostration; to which succeed profuse diarrhea, delirium, convulsions and general insensibility.	The treatment should be the same as for the solaneæ.
Melanthaceæ. *Veratrum Album.* White hellebore *Veratrum Viride.* American hellebore. *Colchicum.* Autumnale.	The symptoms of poisoning by these agents are, violent vomiting (sometimes of blood); tenesmus; burning sensation of the mouth, throat, œsophagus and intestines; constriction of the throat, with a sensation of strangulation; griping pain in the bowels; small, and in some cases almost imperceptible pulse; faintness; cold sweats; tremblings; giddiness; blindness; convulsions and insensibility.	The treatment for poisoning by these agents should be the same as above; emetics, however, will not have to be used. Hahnemann recommends coffee as a drink and as a clyster; astringent infusions, demulcent liquids, and opium, are strongly recommended. *Chlorine*, *bromine* and *iodine* have been recommended as antidotes to all of the *acro-narcotic* poisons.
Lagoniaceæ. *Strychnos Nux Vomica.* *Strychnos Tieute.*	The symptoms of poisoning by the strychnia and brucia, and the agents that contain them are,	In cases of poisoning by these agents, it is recommended to evacuate the stomach by the stomach-pump or an active emetic immediately. Whether this is done or not, the

ACRO-NARCOTICS—CONTINUED.

Poisons.	Symptoms.	Treatment.
Strychnos Toxifera. Wourali. *Ignatia Amara.* St. Ignatius Bean. The active principles. *Strychnia.* *Brucia.*	a feeling weight and weakness in the limbs; trembling of the limbs, and rigidity, or slight spasms when motion is attempted; increased sensibility; the voluntary muscles are thrown into a convulsed state on the slightest motion; finally, *tetanic* spasms of the entire body are produced, which pass off, and a calm succeeds; which, however, is succeeded by more violent spasms. This continues until the violence of the paroxysm destroys life, apparently by producing a state of asphyxia.	patient should at once be made to swallow as much sweet-oil, lard-oil, lard, or other fixed oil, as the stomach will retain; at least, from two to four pints should be administered; if the stomach-pump can be obtained, the stomach may be emptied after each pint of oil taken. This has been found to be the best antidote to the poison, though *chlorine*, *iodine* and *bromine*, have been recommended. The secondary symptoms will have to be treated on general principles.

NARCOTICS.

Poisons.	Symptoms.	Treatment.
HYDROCYANIC ACID, PRUSSIC ACID.	In poisoning by hydrocyanic acid, the symptoms are: a remarkably bitter taste, sometimes described as hot; a sensation of faintness and giddiness; salivation, which is succeeded by *tetanic* convulsions and insensibility. If the quantity taken has been large, it destroys life almost immediately. If the patient recovers, its influence passes off very quickly. The whole period of suffering rarely exceeds half an hour.	There is no antidote to the action of this poison. The most important agents in the treatment of poisoning by it, or substances which contain it, are *ammonia*, *chlorine*, the cold *affusion*, and *artificial respiration*. Chlorine is the most efficient of these, in the form of chlorine water, weak solutions of chloride of lime or soda. Inhalation of liquor ammonia diluted is next in importance; the cold affusion may be used as an adjuvant.
OPIUM AND ITS PROXIMATE PRINCIPLES.	Opium or morphia, when given in poisonous doses, rarely produce their primary stimulant effects. Stupor, approaching to coma, almost immediately sets in; the breathing is slow, sometimes stertorous; the pulse is usually about ninety, weak and irregular, occasionally slow, full and strong, like the pulse of apoplexy; the muscles are relaxed; the face is pale and tranquil, sometimes tumid, suffused and anxious; the body is usually bathed in sweat. When a case of poisoning by opium terminates favorably, the patient falls into a sound sleep, lasting 24 or 36 hours; out of	In treating a case of poisoning by opium or its active principles. the first object to be attained is the evacuation of any poison that may remain in the stomach. The best means of accomplishing this, is to resort to the stomach-pump; but when this can not be obtained, an emetic of mustard; or if that does not succeed, of sulphate of zinc should be administered. It will be recollected that sometimes the stomach is so paralyzed that emesis can not be excited. The next point is to remove the drow-

NARCOTICS—Continued.

Poisons.	Symptoms.	Treatment.
	which he wakes merely affected by slight nausea, thirst and vertigo.	siness and stupor: here every thing calculated to stimulate the patient should be employed, the cold affusion, cold douche, etc.; but above all, the patient should be kept constantly in motion. Driving the patient over rough roads in a wagon, he being supported on each side by an assistant, would probably be one of the best plans.
Hyoscyamus.	The symptoms of poisoning by hyoscyamus are, giddiness, loss of speech, great dilation of the pupil, delirium, frequently of the most violent type, and subsequently a lethargic or comatose state.	The treatment should be the same as in poisoning by opium.

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Cinchona or Cinchonidia Sulphas. Has nearly the same value as sulphate of quinia, but not so apt to produce head symptoms. May be used as an antiperiodic if the pulse is soft, skin soft, tongue moist, and nervous system free from irritation. (The antiperiodic quantity for an adult is grs. x. to grs. xv.).......... 437

Citrus Limonum. Lemon juice is a remedy for rheumatic pain, when the tongue and mucous membranes are very red, the urine being alkaline.......... 367

Coca. Easily tired; feeling of weariness; difficult and labored respiration; temperature not increased—gtt. j. to gtt. xx.......... 386

Collinsonia. A sensation as if some foreign body was lodged in the rectum, with contraction of the sphincter; contracted and painful perineum—gtt. x. to water ℥iv. In chronic laryngeal irritation or inflammation, with sense of tickling in larynx, and cough arising from use of the voice—℥j. to syrup ℥iij.......... 248

Colocynth. Cutting pain in the abdomen, with diarrhœa and dysentery, tenesmus increasing the pain—gtt. v. to gtt. x. in water ℥iv... 172

Conium. In rheumatic or neuralgic pain of feeble old persons; or in local disease with cacoplastic deposit—gtt. x. to ʒj. in water ℥iv.... 331

Cuprum. A blood-maker after severe hemorrhage or exhaustive discharges, the skin being pale and transparent. In chlorosis and other diseases, when the skin has a dirty greenish tinge. The tongue is usually clean and the breath sweet—gtt. v. to gtt. x. in water ℥iv.......... 469

Cypripedium. In nervousness and sleeplessness from atony—gtt. ij. to gtt. xx.......... 643

Cubeba. A remedy in the second stage of gonorrhœa, when the acute irritation has passed by; in enfeebled conditions of the large intestine and rectum—grs. ij. to grs. x.......................255

Digitalis. The stroke of the pulse is feeble; the current of blood is easily stopped by pressure; the sounds of the heart faint—gtt. x. to water ℥iv.......................287

Dioscorea. Abdominal pain of the nature of colic, with tenderness on pressure—gtt. x. to ʒj., water ℥iv.......................207

Drosera. The cough is expulsive as from irritation that can not be controlled; the cough of measles; whooping cough—gtt. x. to ʒj. in water ℥iv.......................571

Elaterium. (Elaterium ʒss., alcohol Oj.) It has a specific influence upon chronic inflammation of the bladder. Passages of mucus or muco-pus with tenesmus; deep soreness in the bladder with dragging in the perineum—ʒss. to ʒj. at first to catharsis, then in doses of gtt. j. to gtt. v.......................174

Erigeron, (Oil of.) A remedy in active hemorrhage, with strong and not very frequent pulse—gtt. j. to gtt. v.......................554

Eriodyction Glutinosum (Yerba Santa). Cough with abundant and easy expectoration—gtt. v. to xx. with syrup.

Eryngium. Uneasiness in the bladder, frequent desire to urinate, and painful micturition; pain in the bladder extending to the loins—gtt. x. to ʒj. in water ℥iv.......................250

Epilobium. Diarrhœa with colicky pains; feculent discharges with tenesmus; diarrhœa with contracted abdomen; chronic diarrhœa with harsh, dirty, constricted skin—an infusion, or of the tincture gtt. x. to gtt. xx.

Ether Sulphuric. Headache, with pallid, expressionless face, feeble pulse, and cool extremities—gtt. v. to x. on a lump of sugar....402, 636

Eucalyptus. Sensations of coldness and weight in bowels; cold extremities; cold perspiration; perspiration during chill—in small dose, gtt. x. to water ℥iv.; or in ague the larger dose of gtt. x. to ʒj.467

Eupatorium (Perfoliatum). Full pulse, full skin, tendency to perspiration even during fever; deep-seated pains in muscles and bones—gtt. v. to gtt. xx. in water ℥iv.......................210, 293

Eupatorium (Purpureum) Urine scanty, milky; weight in loins; skin hot, dry, and constricted—gtt. x. to ʒj in water ℥iv.......................241

Euphorbia (Hypericifolia). Diarrhœa, the discharges being greenish and irritant; frequent desire to go to stool, which relieves sometimes without any motion—gtt. x. to water ℥iv.......................125

Euphorbia (Corollata). The elongated and pointed tongue, prominent papillæ; uneasy sensations in the stomach and bowels as of a desire to go to stool—gtt. x. to water ℥iv.......................125

Ferrum (tinc. of the acetate). Pallid, transparent skin; blueness of veins; dull, heavy pain in back of head—gtt. j. to gtt. v. in a wine glass of water three times a day.......................462

Ferrum (tincture of the chloride). Erysipelatous disease, the part affected being deep red; tongue deep red; mucous membranes and throat somewhat full, and showing same redness—gtt. v. to gtt. xx. at a dose...460, 560

Ferrum (syrup of the iodide). Enlargement of the lymphatic glands, without deposit in connective tissue; pallid though full tissues; difficulty in retaining urine; sometimes stillicidium—gtt. v. to ʒss. 461, 495

Gallic Acid. Hemorrhage, with feeble pulse, cold extremities, and inelastic skin—dose, grs. v...544

Galium. Nodulated growth or deposits in skin or mucous membranes —gtt. x. to water ℥iv...446

Gaultheria. Irritation of the base of bladder and prostate, leading to sexual excitement; increased sexual excitement, evidently from wrong of the reproductive organs, and not the mind—gtt. v. to x...488

Gelseminum. Flushed face, bright eyes, contracted pupils, increased heat of head, restlessness and indisposition to sleep, pain in the entire head; urine is passed with difficulty and in small quantity, with sense of irritation in the urinary organs,..................285, 419, 638

Gentiana. Sense of depression referred to epigastric region, and associated with sense of physical and mental weariness—gtt. j to gtt. v.450

Gadus Morrhua (cod oil). Deposit of cacoplastic or aplastic material in cellular tissue, with tendency to breaking down, with subacute inflammatory action...422

Geranium. Diarrhœa with constant desire to go to stool; chronic diarrhœa with mucous discharges—gtt. j. to gtt. x.........................544

Ginseng. Nervous dyspepsia; sensation of dullness in head, with inability to control the voluntary muscles—gtt. x. to ʒj. in water ℥j....454

Gossypium. In large doses will bring on and stimulate uterine contraction. As an emmenagogue when there is backache, with sense of dragging in the pelvis; sense of fullness and weight in the bladder, with difficult micturition—gtt. x. to ʒj. in water ℥iv...............609

Graphites (1st homœopathic dilution). Tardy menstruation, with disturbance of the nervous system; skin pale, or pale with dirty tinge; slow, difficult respiration, almost stopping during sleep.

Grindelia. Asthma; labored respiration with dusky flushing of face; (person plethoric;) old atonic ulcers; tissues full—ʒj. to syrup ℥ij.; as a local application, ℥j. to water Oj...501

Guarana. Headache, with pallid face, feeble pulse, increased by exertion—gtt. x. to ʒss. as a dose..337

Hamamelis. Fullness and relaxation of tissue; fullness of veins, inclined to dilatation; laxness of muscular fibre; increased secretion of mucus; sensations of fullness, weight and dragging—distilled extract: dose, gtt. j. to gtt. xxx.; and as a local application, one part to three or four of water...558

Hedeoma (Pennyroyal). To restore the lochial discharge—use as an infusion...211, 614

Helleborus (Niger). Dullness of intellect, heaviness of head, coldness of forehead, with clammy sweat; jelly-like mucous discharge from the bowels—gtt. j. to gtt. v. in water ℥iv.............................178, 616

Helonias. Mental depression and irritability associated with chronic disease of the reproductive organs of women—gtt. v. to ʒss. in water ℥iv.............................450

Hydrastis. Irritation with enfeebled circulation, whether used as an internal remedy or as a local application. It is not a remedy for acute inflammation with arrest of secretion. It is especially applicable in diseases of mucous membranes, should nôt be used when connective tissue is principally involved—sulphate or phosphate of Hydrastia, gr. j. to water ℥iv.............................439, 441

Hypophosphite of Lime. Is especially indicated when there is a deposit of aplastic or cacoplastic material in connective tissue, slight inflammatory symptoms resulting; tuberculosis; phthisis pulmonalis—grs, ij. to grs. v. three times a day.............................465

Hypophosphites, (Compound syrup.) When there is an enfeebled circulation, and feeble nutrition of nerve-centres. The surface is usually pallid, waxen, and the extremities inclined to be cold.........467

Hyoscyamus. "Delirium with hallucinations"—gtt. v. to gtt. x. water ℥iv.............................326

Hypericum Perforatum. It is claimed that it exerts a marked influence in relieving irritation in injuries of the spine, and in punctured or lacerated wounds of the extremities, preventing tetanus. Relieves the excruciating pain of such injuries—gtt. v., water ℥iv.

Iberis Amara. Cardiac hypertrophy; dropsy from cardiac disease; asthma associated with cardiac disease; pulse "purring," full and tremulous.

Ignatia. Morning chills; feels better out of doors; deep-seated and dull pain in epigastrium, feeling as if the stomach was dragged backwards; weak empty feeling in stomach; pain shooting from right hypochondrium to shoulder—gtt. v. to water ℥iv.............................384

Ipecacuanha. Irritation of mucous membranes, with increased secretion—diarrhœa, dysentery; inflammation of parenchyma of lung—gtt. v. to xv., in water ℥iv.............................115, 137, 205, 569

Iodide of Potassium. Pale, leaden-colored tongue, usually full; contraindicated by contracted red tongue. Antisyphilitic with this indication—grs. v. to grs. x.............................494

Iodide of Ammonium. Dull pain in head with dizziness, and inability to command the voluntary muscles—ʒss., water ℥iv.; a teaspoonful three times a day.............................495

Iris. Fullness of throat, enlargement of thyroid gland, fullness of throat with pulsation of arteries—gtt. x., water ℥iv., and as a local application.............................179

Juglans Cinerea. In large doses it is an excellent laxative; in small doses it relieves irritation of the stomach and intestines, and promotes digestion. It may be thought of as a remedy in chronic eczema—gtt. v. to water ℥iv.............................164, 491, 523

Kalmia. In syphilis with excited circulation—gtt. v. to x., water ℥iv.

Lavandula, (Compound spirit). The child's stimulant; combined with Lobelia in asthenic bronchitis, and in atony of bowels with pain.......362

Lactic Acid. Deep redness of the tongue, deep redness of skin, pulse oppressed. (Whey is a most excellent form.).......697

Leptandra. Dull heavy pain in right hypochondrium, fullness of abdomen; tongue coated markedly white, but not a fur; is thirsty but can not drink water; restless and can not sleep—Leptandrin gr. ½ to gr. j.; tincture, gtt. x., water ℥iv.......166

Lithium, (Benzoate of).) Uneasiness in the loins, extending to the bladder; passage of mucus with phosphates from bladder; fullness and tension in perineum, and desire to micturate frequently, with difficulty in passing urine—gr. j. in a glass of water three times daily.......498

Lobelia. Sense of fullness and oppression in præcordial region; oppression of chest and difficult respiration; sharp lancinating pain starting in heart and radiating to left shoulder and arm; mucous rattling in throat; full, oppressed pulse, weak pulse—stimulant doses, gtt. x. gtt. xx. at a single dose in angina pectoris; gtt. x. to water ℥iv. in ordinary disease; combined with Lavender for asthenic bronchitis of the child.......117, 294, 567, 639

Lycopus. Chronic cough with frequent pulse and high range of temperature; hemorrhage with frequent pulse; albuminuria with frequent pulse; Bright's disease—gtt. x. to gtt. xx., water ℥iv.......301

Macrotys. Muscular pains; uterine pain with tenderness; false pains, irregular pains; rheumatism of the uterus; dysmenorrhœa. An anti-rheumatic when the pulse is open, the pain paroxysmal, the skin not dry and constricted—gtt. x. to gtt. xx., water ℥iv.......423, 607

Menispermum. Skin brown, tongue coated at base, tip red, irregular appetite, constipation—ʒj. to water ℥iv.......491, 452

Mentha Viridis. Scanty secretion of urine, frequent desire to pass water—gtt x. to ʒj., water ℥iv.......216, 259

Mercury. I do not believe in the use of mercury, because physicians can not learn to use such remedies rightly, and when contra-indicated it produces such terrible and lasting effects. But in this index of indications for remedies it will not do to pass it by without pointing out the special indications which will permit its use in small medicinal doses. The tongue is contracted, elongated, pointed, of rather more than usual redness, and the papillæ prominent. With a full, pallid, expressionless tongue, and marked absence of papillæ, it will prove a poison, sometimes of the most virulent kind.

Mitchella. Uneasy sensations in the pelvis, with dragging, tenderness on pressure, frequent desire to pass urine, and difficulty of evacuation—ʒj. to water ℥iv.......611

Myrica. Increased secretion from mucous membranes, they being full and relaxed; full, oppressed pulse; imperfect circulation to surface and extremities.......551, 661

Morphia. The pulse is small and soft, waves short and square, distance between waves long—this is the specific indication. It is permissible to relieve pain or produce sleep, when the pulse is soft. tongue moist........ . ...321, 638

Nepeta Cataria. Pain in abdomen, flexing of the thighs upon the abdomen, writhing of the patient, persistent crying—ʒj.; water ℥iv.

Nicotiana Tabacum, (tincture of the fresh plant.) Pneumonia or bronchitis, with pallid skin, coldness of extremities, imperfect circulation of blood—gtt. x., water ℥iv..302, 332

Nitric Acid. Violet color of tongue, transparent, the redness of the tongue showing below—gtt. xx., water and syrup ℥ij... .... 521, 534

Nitrate of Soda Violet color of tongue, transparent, the tongue being somewhat pallid below; tongue full, swollen, covered with a white or yellowish mucus—grs. x. to ʒij., water ℥iv.

Nux Vomica. Sallow, expressionless tongue, with nausea and vomiting; sallow, expressionless mouth, with tinge of yellow; abdominal pain, paroxysmal, pointing at umbilicus; tumid abdomen with paroxysmal pain; paroxysmal pain in right hypochondrium, shooting to right scapula; paroxysmal pain in uterus, extending to umbilicus; in diarrhœa the discharges are large, and attended with colicky pain..138, 381

Oleum Morrhuæ. Tissues soft, atonic, with aplastic or cacoplastic deposit; soft, feeble tissues, frequent pulse, with increased temperature part of the day.. 492

Opium. The pulse is small, with short waves, gives a sensation of fullness. It is permissible to relieve pain and induce sleep, when the pulse is soft and open, the skin soft and inclined to moisture, tongue moist. 205, 320

Potassæ Carbonas. Pallid, expressionless tongue, fullness of muscles. greater loss of strength than can be accounted for by conditions of disease—add to water so as to make a pleasant drink, and continue until tongue assumes its normal redness.................................672

Potassæ Chloras. The antiseptic of the puerperal state; when portions of the placenta, blood-clots, etc.. are retained and undergoing decomposition; fetid lochiæ, fetid breath, fetor as from decomposing animal matter—from grs. v. to ʒij. may be given in the twenty-four hours, and used as a local application...................424, 594

Potassæ Nitras. Scanty urine, with difficult respiration; difficult deglutition as from paralysis of muscles of the throat; enlargement of tonsils. Burned to relieve asthma—gr. v. to ʒij., water ℥iv. 218, 266

Potassæ Permanganas. As a local application only, in phlegmonous erysipelas. in inflammation where tissues have lost vitality, and are inclined to slough; in the early stage of felons and boils, to arrest the progress of inflammatory action—ordinary use, ʒj. to water Oj; for the last use grs. x., water ℥j.

Potassii Ferrocyanidum. Hysteria or hypochondriasis, with slow imperfect waste and nutrition—ʒj. to ℥ss., water ℥iv......................308

Potassæ Sulphas. The color of the skin is dirty, tissues full and sodden, skin scaly; wounds heal slowly, inflame and suppurate—grs. v. to grs. x. three times a day in a glass of water..........................496

Penthorum Sedoides. Catarrhal inflammations; nasal catarrh, with fullness of mucous membranes and abundant secretion; spongy gums; fullness of fauces and mucous membrane of pharynx; catarrhal disease of stomach, catarrhal diarrhœa—gtt. x. to ʒj., water ℥iv..........................465

Phosphorus, (tincture of.) Vesical and prostatic irritation, with mucoid discharges; fullness with dragging in perineum; discharges of mucous from rectum, with sense of weariness from lower extremities. In pneumonia with sense of oppression, and difficulty of expectoration, livid face—gtt. v. to x., water ℥iv..........................465

Phosphorus. (Phosphorated oil, Phosphorus pills; dose, gr. 1-100 to 1-50.) As a nerve stimulant, especially when there is feeble reproductive power. Indications—a soft pulse, cold extremities, inelastic skin, pendulous scrotum, fullness of lower abdomen in women, without sharp pain..........................465

Phosphate of Soda. As a restorative when there is pallidity of the tongue and mucous membrane, and constipation. It is especially valuable for children—grs. j. to grs. xx., three times a day.

Phytolacca. Soreness of mouth, soreness of throat, with tendency to death of epithelium; diphtheritic deposits, fullness about throat externally; enlarged cervical epithelium; caking of breasts, inflammation of breasts, sore nipples; disease of the skin or of the blood with death of and imperfect reproduction of the epithelium—gtt. x to ʒj., water ℥iv..........................423, 476, 663

Pix Liquida. (Glycerole of Tar.) The remedy for pruritus ani, and for some diseases of the skin with pruritus. For cough with profuse bronchial secretion, add one part of glycerole of tar to seven parts of glycerine, two parts of water..........................581

Podophyllum, Podophyllin. Fullness of veins, fullness of face, fullness of abdomen, fullness of tongue with pasty secretion..........................161

Polygonum. Want of menstrual flow, chilly sensations in back, tensive pain, pain of legs, skin harsh and inactive—gtt. x. to ʒij., water ℥iv..........................207, 611

Propylamin. In rheumatism when febrile action has been relieved —gtt. v. to gtt. x., mint water ℥iv.

Pulsatilla. Patient is nervous, despondent, restless, sleepless; pulse soft, easily compressed; eyes dull, dark line under them; reproductive excitement; fear of impending danger; menses arrested, tardy, scanty—gtt. x. to gtt. xxx., water ℥iv..........................297, 608

Quinia Sulphas. Periodicity—the pulse being soft, skin soft, tongue moist and cleaning, nervous system free from irritation—antiperiodic quantity grs. x. to grs. xx. As a stimulant, in small doses, when the above conditions of body are present..........................435

Rheum. Irritation of stomach, nausea, vomiting; tongue elongated, reddened at tip and edges; diarrhœa, with tenderness on pressure; sour smell of child—gtt. x. to gtt. xx., water ℥iv........................160

Rhus Tox. Small, sharp pulse; pain in forehead, especially in left orbit; burning pain; tongue shows red spots on upper surface of tip—gtt. v., water ℥iv.. 289, 420

Rumex Crispus. Cough, with sense of irritation in trachea and larynx—gtt. v. to ʒss., syrup ℥ij..482

Salicin. Periodicity, the patient complaining of severe pain, rheumatic in character, or simulating rheumatism—antiperiodic quantity grs. xv. to grs. xxx., in divided doses. As an anti-rheumatic, the febrile action being controlled by the sedative..................422, 441

Salvia. Profuse sweating, continued inaction of the skin, feet sweat and get cold, night sweats—gtt. v. to ʒj., water ℥iv.................217, 368

Salicylic Acid. Anti-rheumatic, and the indication, rheumatic pain without much febrile re-action; sub-acute rheumatism. The tongue is slightly leaden colored, and shows spots when the fur is lifted—as an anti-rheumatic, grs. ij. in pill, every three hours until grs. xx. are taken. An admirable local application in chronic catarrhal disease of mucous membrane. ℞ Salicylic Acid, Borax *aa.* ʒj, water Oj...422, 596

Sambucus Canadensis. In disease of the skin, when the tissues seem full; epidermis separates and there is abundant serous discharge which forms crusts; indolent ulcers; tissues full, flabby, as if containing water—gtt. x. to gtt. xx., water ℥iv.................................253

Sanguinaria, (Nitrate of). Tickling or irritation of throat with cough; sense of irritation in nose; uneasiness at supra-sternal notch; sense of uneasiness and burning in stomach, with nervousness—grs. j. to grs. ij, syrup and water ℥iv..568

Secale, Ergot. Dullness of intellect, disposition to sleep, dizziness; tissues full, inelastic; pulse oppressed; fullness of abdomen; hemorrhage with above conditions—gtt. j. to ʒss...........................622

Scutellaria. Hysteria with inability to control the voluntary muscles; nervousness manifesting itself in muscular action—gtt. v. to ʒj., water ℥iv. Sometimes quite large doses will be required...............644

Senecio. Enlargement of uterus with uterine or cervical leucorrhœa; difficulty in urination—gtt. v. to ʒj, water ℥iv............................612

Sodæ Sulphas. As an antidote to lead—℥ss. to water ℥iv. To increase waste, when the skin is full, inelastic with brownish-sallow discoloration—grs. ij. to grs. xv. in a glass of water three times a day. It is a remedy in dysentery when there is the same appearance of skin.185

Sodæ Sulphis. The tongue is broad, pallid, and has a dirty coat—grs. ij. to grs. xx..590

Spongia Tosta. (In homœopathic dilution.) Hoarse croupal cough, wheezing inspiration, soreness and burning in air passages—gtt. x. to water ℥iv.

Stillingia.—Irritation of superior pharynx, and just behind the fauces, causing cough; hoarse croupal cough, paroxysmal, as if from great laryngeal irritation; skin disease, showing marked irritation, with ichorous discharge—for croup, the stillingia liniment as an external application; for chronic cough, the same, half to one drop on a lump of sugar; other uses, the tincture, gtt. x. to ʒij. water ℥iv..............478

Sticta. Cough, with pain in shoulders, extending to the occiput; rheumatic pains, with soreness of shoulders, cervical region, and occiput—gtt. x. to ʒj., water ℥iv.

Sulphurous Acid. The mucous tissues are of normal redness, but full and feeble; the tongue is coated with a moist, glutinous fur, having a tinge of brown—℥ss. to water ℥iv.; as a local application it is best used with a spray apparatus.,.......................................424

Strychnia. As an antiperiodic when the patient has difficult respiration, tardy and feeble urination, suffers from nightmare—gr. 1-60 to 1-20. In cholera or choleraic diarrhœa, with the same symptoms and great muscular debility..381

Sulphur. The skin is dirty, sallow, brownish, and the mucous membrane has a dirty hue...186, 495

Stramonium. Delirious; can not rest in any position; continuously talking; seems to be fearful—gtt. v. to x., water ℥iv.....................329

Trifolium Pratense. An infusion of red-clover, has a specific influence in spasmodic cough, whooping cough, and the cough of measles.

Thuja Occidentalis. Syphilitic or other diseases of bad blood, with warty excrescences, or ulceration, showing prominence of papillæ—gtt. x., water ℥iv..503

Urtica Dioica. Chronic diarrhœa or dysentery with evacuations of mucus; chronic inflammation of bladder with abundant mucous discharge—gtt. x. to ʒj., water ℥iv...549

Uvedalia. Enlargement of the spleen, ague cake; hypertrophy, with sensations of weight and dragging, and when felt seems sodden, wants elasticity; the skin is full, inelastic and sallow—internally, gtt. j. to gtt. xx.; as a local application the Uvedalia ointment, rubbed in with heat...500

Valerian. A cerebro-spinal stimulant. especially valuable as a remedy in chorea when stimulation is desirable—gtt. ij. to ʒss............643

Veratrum Viride. The pulse is frequent and full, tissues full, not shrunken; surface flushed with blood. In erysipelas the part presents somewhat the appearance of an ordinary inflammation—gtt. v. to ʒj., water ℥iv...278, 419

Viburnum Opulus. Cramp like pains, pain recurring at intervals; to prevent abortion or miscarriage; in dysmenorrhœa, when the pains are expulsive; during labor if the pain assumes the form of spasmodic contraction, the muscular tissues of the perineum being also involved—gtt. x. to ʒss., water ℥iv...............................630, 647

Viburnum Prunifolium. This has been regarded as especially the remedy to arrest abortion or miscarriage, and it may be used for the same indications as the other species—gtt. x. to xx., water ℥iv.630

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